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ARITHMETIC
MADE EASY TO CHILDREN:
BEING A COLLECTION
OF
USEFUL AND FAMILIAR EXAMPLES
METHODICALLY ARRANGED
UNDER THEIR
RESPECTIVE HEADS.

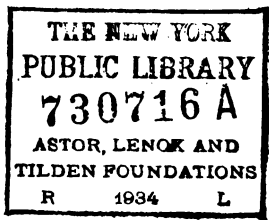
BY EMMOR KIMBER.

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1805.



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PREFACE.

THE object contemplated in the following publication is to afford children an easy introduction to arithmetic, by elucidating the primary rules of the science, with a suitable collection of useful and familiar examples; which to those whose situations admit of their receiving but a small portion of schooling is found to be particularly serviceable.

At the ages children are generally put to arithmetic, their progress is much obstructed by long sums and intricate questions, which have a tendency to discourage them in their first setting out, and greatly to increase the labour of teachers: The utility of this attempt to remove those difficulties is submitted to the judicious, from whom any hint tending to improve the plan will be kindly received by

E. K.

Philadelphia 1st mo. 1805.

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Explanation of Signs.

<i>Signs.</i>	<i>Significations.</i>
$=$	equal ; as $20s. = \text{£}.1.$
$+$	more ; as, $6 + 2 = 8.$
$-$	less ; as, $8 - 2 = 6.$
\times	multiplied by ; as, $6 \times 2 = 12$
\div	divided by ; as, $6 \div 2 = 3.$
$: :: :$	proportionality ; as, $2 : 4 :: 6$

ARITHMETIC.

Arithmetic is the art of computing by numbers. It has five principal rules for its operations ; viz. numeration, addition, subtraction ; multiplication and division.

NUMERATION.

Numeration teaches to express numbers by figures, set down or named, and consists of two parts, viz.

First, The right placing of figures.

Second, The true valuing of figures according to their places, both which are exhibited in the following

TABLE.

Units	Tens	Hundreds	Thousands	Tens of Thousands	Hund. of Thousands	Millions	Tens of Millions	Hundreds of Millions
1								
2	1							
3	2	1						
4	3	2	1					
5	4	3	2	1				
6	5	4	3	2	1			
7	6	5	4	3	2	1		
8	7	6	5	4	3	2	1	
9	8	7	6	5	4	3	2	1
A								

One
 Twenty one
 Three hundred & 21
 4Thousand 321
 54Thousand 321
 654Thousand 321
 7 Million 654 321
 87 Million 654 321
 987 Million 654 321

2. Two hundred and nine.
3. Four thousand and sixty five.
4. Seven thousand and eighty nine.
5. Sixty nine thousand four hundred and twenty.
6. Eight hundred and sixty two thousand and nineteen.
7. Nine hundred and twenty seven thousand.
8. Fifty thousand seven hundred and twenty.
9. One hundred and twenty thousand and fifty four.
10. One Million four hundred and eighty thousand eight hundred seventy five.
1. Two Million four hundred and eighty thousand one hundred.
2. Seven hundred and sixty five thousand and ninety two thousand and fifty.

RULE.

Place the numbers under one another, with units under units, tens under tens, &c. Then begin at the right hand column or line of units and add upwards, set down the total if less than 10; if 10, or more, the right hand or units figure and add the left to the next row figures; then proceed to the last column unit, which set down its whole amount.

PROOF.

Perform the addition downwards.

EXAMPLES.

213	132	214	431
321	214	131	123
442	321	542	245
<hr/>	<hr/>	<hr/>	<hr/>
976			
<hr/>	<hr/>	<hr/>	<hr/>

134	371	432	615
213	423	513	231
326	162	641	842
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>

4322	5121	3214	2165
3146	1321	7191	2237
6719	3437	6196	6196
8371	2998	3249	2169
<u> </u>	<u> </u>	<u> </u>	<u> </u>

3161	6101	3213	6231
2194	2376	2196	1323
7982	1279	1798	9696
8697	6414	8989	3798
<u> </u>	<u> </u>	<u> </u>	<u> </u>

4697	1238	1261	2312
3246	3140	2314	1231
9702	2184	1276	3766
1094	3746	1324	1998
7460	2167	9676	8196
<u> </u>	<u> </u>	<u> </u>	<u> </u>

6104	1126	6179	1276
319	3212	316	100
7162	376	16	11
19	19	18	7239
3708	8	2167	16
<u> </u>	<u> </u>	<u> </u>	<u> </u>

1. Collect 121, 764, 25 and three thousand four hundred and ninety eight into one sum. *Facit* 4408.

2. What sum do 16, 372, 1896, and three hundred and nine amount to? *Ans.* 2593.

3. What is the amount of 121, 764, 319, 124, and twenty seven? *Ans.* 1355.

4. Add 27, 376, 29, and six hundred and ninety nine together. *Facit* 1131.

5. Add one thousand four hundred and twenty six, 9, 3, and 7 together. *Facit* 1445.

6. Joseph was born in the year 1791, in what year will he be 21 years of age? *Ans.* 1812.

7. What is the sum of four thousand seven hundred and thirty six, six thousand two hundred forty eight, two thousand five hundred and eighteen, and nine thousand five hundred and twenty? *Answer* 23022.

8. Tell the amount of twenty seven thousand one hundred and twenty, thirty six thousand seven hundred and forty six, seventy five thousand, eighty four thousand seven hundred, and eighty seven thousand nine hundred and fifty seven.

SUBTRACTION OF INTEGERS.

Subtraction of integers is the taking of a less number from a greater, and shews the remainder or difference.

RULE.

Place the less number under the greater, with units under units, tens under tens; then beginning with the units, take the figure from the upper and set down the remainder underneath; but if the lower be greater than that above, take it from the next higher place, and add the remainder to the upper figure; then their sum, carry 1 to the next place, and so proceed,

PROOF.

Add the remainder to the less number; the sum, which will produce the greater number.

EXAMPLES.

From	42976	54268	63978	64
Take	21324	31145	31827	31
	<hr/>	<hr/>	<hr/>	<hr/>
Rem.	21652			
	<hr/>	<hr/>	<hr/>	<hr/>
Proof.	42976			
	<hr/>	<hr/>	<hr/>	<hr/>
	<hr/>	<hr/>	<hr/>	<hr/>
	413164	356792	328676	96
	292113	194511	179152	58
	<hr/>	<hr/>	<hr/>	<hr/>
	<hr/>	<hr/>	<hr/>	<hr/>

783679	143764	542671	543768
594199	69173	219291	279689
<hr/>	<hr/>	<hr/>	<hr/>

834976	327619	619764	715327
675196	139279	78496	89178
<hr/>	<hr/>	<hr/>	<hr/>

760006	370420	716400	870577
102197	12301	27908	502108
<hr/>	<hr/>	<hr/>	<hr/>

761000	804321	617097	142710
403727	545083	71000	7109
<hr/>	<hr/>	<hr/>	<hr/>

1. From 19 subtract eleven. *Facit* 8.
2. Take 19 from 100. *Facit* 81.
3. Subtract 109 from 306. *Facit* 197.
4. What is the difference between 66 and 16? *Ans.* 50.
5. Joseph was born in the year 1791, what is his age in the present year 1805? *Ans.* 14 Y.

6. A man was born in the year 1727, died in the year 1801, what was his age at the time of his decease? *Ans. 74*

7. From fifty four thousand seven hundred and forty two, take twenty eight thousand hundred and seventy four.

8. What is the difference between seven hundred millions and seven hundred thousand?

MULTIPLICATION OF INTEGER

Multiplication of Integers teaches to find a number equal to another, taken any proper number of times; in which there are three parts, viz.

First, The *multiplicand*, or number to be multiplied.

Second, The *multiplier*, or number to multiply by.

Third, The *product*, or number produced.

Note. The multiplier and multiplicand are also called *factors*.

MULTIPLICATION TABLE.

1	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	45	50	55	60
6	12	18	24	30	36	42	48	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

When the multiplier does not exceed 12,
work by

RULE. 1.

Place the multiplier under the units figure
of the multiplicand; multiply each figure there-
of; carry the tens of each product, and set
down the units as taught in addition.

PROOF.

The product of the multiplicand by double
the multiplier, will equal the former product
multiplied by 2.

EXAMPLES.

Multiplicand 3794637 3
 Multiplier 4

Product 15178548 Proof 303

Proof 30357096

231421	123213	421121	3626
2	3	4	

834736	794716	927464	568712
2	3	4	5

438167	815769	849776	457967
6	7	8	9

8396725	8371642	7161091
10	11	12

When the multiplier consists of several figures, work by

RULE. 2.

Use each figure of the multiplier separately, as under rule 1, observing to place the first figure of each product under its multiplier, and add the products together for the number sought.

PROOF.

Change the factors, making the multiplicand, multiplier &c. the result will be the product as before.

EXAMPLES.

1. Multiply 124 by 23

Multiplicand	124		23
Multiplier	23		124
	<hr/>		<hr/>
	372		92
	248		46
	<hr/>		23
Product	2852		<hr/>
	<hr/>	Proof	2852
			<hr/>

- | | | | | | | |
|---|----------|-------|----|----|-------|---------|
| 2 | Multiply | 16174 | by | 23 | Facit | 37202 |
| 3 | Multiply | 27106 | by | 46 | Facit | 1246876 |
| 4 | Multiply | 19617 | by | 75 | Facit | 1471275 |

- 5 Multiply 42723 by 89 *Facit* 382234
 6 Multiply 31614 by 216 *Facit* 6828624
 7 Multiply 63761 by 275 *Facit* 17534275
 8 Multiply 94637 by 719 *Facit* 68044003
 9 Multiply 76294 by 925 *Facit* 70571950
 10 Multip. 32694 by 7283 *Fac.* 238110402

Note. When there are Ciphers at the right hand of one or both of the factors, omit them entirely in the operation, and place as many zeros to the right of the product.

- 11 Mul. 10790 by 370 *Facit* 399230
 12 Mul. 71612 by 4600 *Facit* 32941520
 13 Mul. 617000 by 876 *Facit* 54049200
 14 Mul. 700090 by 61300 *F.* 4291551700
 15 Mul. 1324000 by 726000 *F.* 961224000000
 16 Mul. 7643000 by 329 *Fac.* 251454700

When the multiplier is the product of two figures not exceeding 12, the sum may be wrought without addition by

RULE 3.

Multiply the given number by one of said figures, and that product by the other.

PROOF.

Repeat the operation with the multiplier transposed.

EXAMPLES.

1. Multiply 271 by 21

271	271
3	7
<hr/>	<hr/>
813	1897
7	3
<hr/>	<hr/>
Product 5691	Proof 5691
<hr/>	<hr/>

Mul.	91312	by	24	Facit	2191488
Mul.	57164	by	32	Facit	1829248
Mul.	36104	by	36	Facit	1299744
Mul.	81027	by	42	Facit	3403134
Mul.	32714	by	48	Facit	1570272
Mul.	93726	by	54	Facit	5061204
Mul.	41071	by	56	Facit	2299976
Mul.	37143	by	64	Facit	2377152
0 Mul.	12376	by	72	Facit	891072
1 Mul.	9164	by	84	Facit	769776
2 Mul.	171276	by	96	Facit	16442496
3 Mul.	526473	by	144	Facit	75812112

EXAMPLES

In Multiplication to exercise the preceding rules.

1. Multiply four hundred and nineteen thousand nine hundred and twenty seven, by seven.

2. What is the product of six thousand seven hundred and thirty five, multiplied by thirty two.

3. Supposing an orchard contained 235 trees, and 1476 apples on each tree; how many apples would there be in the orchard?

4. In 350 bales of cotton, each weighing 520lb. how many pounds?

5. How many lights of gas are there in a room that has 12 windows, and twenty four lights in each window?

6. In 275 pieces of linen containing each 25 yards, how many yards?

7. Multiply 700070 by 7000.

8. One barrel of flour contains 196lb. how many pounds are there in 500 barrels?

9. What is the product of seventy five thousand multiplied by 144?

10. How many square feet are there in a floor 27 feet long and 18 broad?

DIVISION OF INTEGERS.

Division of Integers shews how often a number is contained in another, and consists of four parts, viz.

First, The *dividend*, or number to be divided.

Second, The *divisor*, or number to divide by.

Third, The *quotient*, or number sought.

Fourth, The *remainder*, or number left, which must be less than the divisor. But sometimes there is no remainder.

Note. The part of a dividend which produces a quotient figure, is sometimes termed a *dividual*.

When the divisor does not exceed 12 work by

RULE 1.

Place the divisor to the left of the dividend and see how often it is contained in the first figure or figures; set the result under; if any remain, conceive it to be prefixed to the next dividend figure which divide as before, and so proceed.

PROOF.

Multiply the quotient by the divisor, taking the remainder, if any, into the product of the first figure; the result will equal the dividend.

EXAMPLES.

	Dividend		
Divisor	2)46826	3)69369	4)91684
Quotient	23413		
	2		
Proof	46326		
	5)61767	6)13769	7)71943
	8)61416	9)72979	10)61476
	11)71969	12)61647	6)47195
	7)61097	8)16199	9)5174

EXAMPLES.

- 7 Divide 716234 by 21
- $$\begin{array}{r} 3 \overline{) 716234} \quad 7 \overline{) 716234} \\ \underline{30} \\ 41 \\ \underline{00} \\ 16 \\ \underline{00} \\ 62 \\ \underline{00} \\ 23 \\ \underline{00} \\ 19 \\ \underline{00} \\ 10 \\ \underline{00} \\ 03 \\ \underline{00} \\ 01 \\ \underline{00} \\ 01 \end{array}$$
- Quotient 34106 + 2 } 8 R. 3102319 + 1 } 8 R. 34106 + 1 } 8 R.
- 8 Divide 376496 by 28 *Facit* 13445 +
- 9 Divide 432947 by 48 *Facit* 9019 + 3
- 10 Divide 543875 by 63 *Facit* 8632 + 5
- 11 Divide 654389 by 81 *Facit* 8078 + 7
- 12 Divide 767532 by 84 *Facit* 9137 + 2
- 13 Divide 895214 by 144 *Facit* 6216 + 11

When the divisor consists of several figures and is not the product of any two factors in the multiplication table, the sum must be wrought by

RULE 2.

Take for the first dividend, only as many of the left hand figures of the dividend as will contain the divisor; try how often the divisor may be had therein, and set the resulting figure to the right of the dividend for the first quotient: subtract the product of this figure and the divisor from the dividend; the remainder, with the next figure of the dividend annexed, will be the second dividend which divide as before and so proceed.

PROOF.

As under rule 1.

EXAMPLES.

1. Divide 4673 by 13

Dividend	
Divisor	13)4673(359 Quotient
	39
	<hr/>
	77
	65
	<hr/>
	123
	117
	<hr/>
Remainder	..6
	<hr/>
	359
	13
	<hr/>
	1083
	359
	<hr/>
Proof	4673
	<hr/>

	Dividends	Divisors	Quots.	Rem.
2	Divide 4165	by 17	Facit 245	
3	Divide 6764	by 19	Facit 356	
4	Divide 9683	by 23	Facit 421	
5	Divide 19652	by 34	Facit 578	
6	Divide 32508	by 43	Facit 756	
7	Divide 37612	by 57	Facit 659	Rem. 49
8	Divide 223796	by 123	Facit 1819	Rem. 59
9	Divide 364527	by 456	Facit 799	Rem. 183
10	Divide 576978	by 789	Facit 731	Rem. 219

Note. When ciphers are on the right divisor, omit them in the operation, fetching from the right of the dividend as many figures, which annex to the remainder

EXAMPLES.

11 Divide 76173 by 320

32|076173(238 Quotient

64

121

96

257

256

238

320

4773

714

Remainder

..13

Proof 76173

12 Divide 240340 by 610 *Facit*

13 Divide 660000 by 1760 *Facit*

14 Divide 1573200 by 3600 *Facit*

15 Divide 4976100 by 9700 *Facit*

16 Divide 6210750 by 6370 *Facit*

17 Divide 21305220 by 15700 *F. 1357+*

18 Divide 99607765 by 27000 *F. 3689+*

19 Divide 391775200 by 53900

Facit 7268 + 30000

20 Divide 862097000 by 98000

Facit 8796 + 89000

EXAMPLES

In Division to exercise the preceding rules.

1. Divide seven hundred and ninety four thousand, nine hundred and fifty six by nine.

2. What is the quotient of fifty seven thousand two hundred and twelve divided by twelve?

3. Suppose 323 apple trees be planted in seventeen rows, how many trees will be in each row?

4. Purchased 350 bales of cotton, containing in all 182000 pounds, how many pounds is that for each bale?

5. Sold twenty five pieces of linen, containing six thousand eight hundred and seventy five yards, how many yards is that a piece?

FEDERAL MONEY.

The Denominations are:

10 mills (m)	make	1 cent, c.
10 cents		1 dime, d.
10 dimes (or 100 c.)		1 Dollar, D.
10 Dollars		1 Eagle, E.

REDUCTION OF FEDERAL MONEY.

Reduction is the reducing, a sum or quantity from a given denomination to another, retaining the same value.

When the sum is to be reduced to a greater name work by

RULE 1.

Divide the given sum by that number of its own name which makes one of the next greater, &c. Remainders retain the names of their respective dividends.

EXAMPLES.

1. Reduce 1575 cents to dollars.

$$\begin{array}{r}
 \text{cents} \\
 1,00 \overline{) 1575} \\
 \hline
 \text{Facit } 15 \text{ D. } 75 \text{c} \\
 \hline
 \end{array}$$

2. In 925 cents how many dollars?

Answer 9 D. 25 cents.

3. Reduce 769 cents to dollars.

Facit 7 D. 69 cents.

* Reduction, being placed before compound addition and division, is only considered here as it relates to those rules;—and a collection of promiscuous examples given, before the scholar enters upon the Rule of Three.

4. Reduce 724 mills to cents. *Facit 72c. 4m.*
 5. How many eagles are there in 1000 dollars? *Answer 100 Eagles.*
 6. What number of dollars is there in 7650 cents. *Answer 76 D. 50 cents.*

When the sum is to be reduced to a less name work by

RULE 2.

Multiply the given sum, or, when of divers denominations, its greatest name, by that number of the next lower denomination which makes one of that, &c. taking the lower names of the given sum into the products of the like denominations.

PROOF.

Reduce the result of the operation back to its given name.

EXAMPLES.

1. Reduce 15 Dols. 75 cents to cents.
 Rule 2. $\begin{array}{r} D. \ c. \\ 15. \ 75 \\ 100 \\ \hline \end{array}$
Facit 1575 cents
- Rule 1. $\begin{array}{r} \text{cents} \\ 1|00)15|75 \\ \hline \end{array}$
 Proof $\underline{\underline{15\ D75c}}$

2. How many cents are there in 27 dollars?
Answer 2700 cents.

3. Réduce 75 dollars to mills.
Facit 75000 mills.
 4. Quere the number of dimes in 50 dollars?
Answer 500 dimes.
 5. What number of cents is there in 9 dollars 57 cents?
Facit 957 cents.
 6. Reduce ten eagles five dollars to dollars.
Facit 105 dollars.
-

ADDITION OF FEDERAL MONEY.

Addition of federal money is the collecting of several sums into one sum.

RULE.

Place the numbers so that those of the same denomination may stand directly under one another; then begin at the right hand column as in integers; add up, set down and carry as taught in that rule.

PROOF.

Perform the addition downward.

EXAMPLES.

<i>D. c.</i>	<i>D. c. m.</i>	<i>E. D. d. c. m.</i>
42, 16	32, 97 9	7 4, 9 6 4
19, 12	37, 96 4	1 9, 6 7 9
72, 96	29, 99 9	3, 7 6 3
37, 66	32, 23 6	9 9, 6 9 6
<hr/>		
171, 90 Total		
<hr/>		
171, 90 Proof		
<hr/>		

1. Add together the following sums, viz. 10 dollars, 4 dollars 19 cents, 1 dollar 75 cents, 2 dollars 9 cents, and six dollars 4 cents and 5 mills.
Facit 24 D. 7c. 5m.

2. Laid out the following sums, viz. 16 cents, 1 dollar 9 cents, 3 dollars 74 cents 5 mills, and two dollars 18 cents; what is the amount?
Answer 7 D. 17c. 5m.

3. What is the amount of 124 dollars, and 15 dollars 75 cents. *Answer 139 D. 75c.*

SUBTRACTION OF FEDERAL MONEY.

Subtraction of federal money teaches to take one sum from another, and shews the remainder or difference.

RULE.

Place the given sums as in addition with the less under the greater; then subtract as taught in integers.

PROOF.

Subtract the remainder from the greater upper sum, and the result will equal the less.

EXAMPLES.

	D.	c.	D.	c.	D.	c.
From	76,	97	961,	64	17,	27
Take	19,	69	376,	97	9,	49
	<hr/>		<hr/>		<hr/>	
Rem.	57,	28				
	<hr/>		<hr/>		<hr/>	
Proof	19,	69				
	<hr/>		<hr/>		<hr/>	

D.	c.	m.	D.	d.	c.	m.	D.	d.	c.	m.
37,	19	6	76,	7	2	9	13,	6	3	7
19,	97	9	19,	9	6	7	9,	7	6	8
<hr/>			<hr/>			<hr/>			<hr/>	
<hr/>			<hr/>			<hr/>			<hr/>	

1. From 10 dollars take 4 dollars 75 cen
Facit 5 D. 25 cen
2. Take 3 dollars 92 cents from 5 dolla
Facit 1 D. 8 cen

3. Out of 20 dollars, having paid a bill amounting to 14 dollars 7 cents, how much remains?
Answer 5 D. 93 cents.

MULTIPLICATION OF FEDERAL MONEY.

Multiplication of federal money teaches to find a sum equal to a given one, taken any proposed number of times; also to calculate the amount of any quantity at the given price of an integer.

When the multiplier does not exceed 12 work by

RULE 1.

Place the multiplier under the lowest denomination in the given sum, and multiply as taught in integers, separating by the point as many right hand places in the product, as stand after dollars in the multiplicand; then read all the figures to the left, dollars, the two next to the point on the right, cents, and the third, if any, mills.

PROOF.

As in integers, under rule 1.

EXAMPLES.

	<i>D. c.</i>	<i>D. c.</i>
Multiply	6, 97	6, 97
by	4	8
	<hr/>	<hr/>
Product	27, 88	55, 76
	2	<hr/>
	<hr/>	
Proof	55, 76	
	<hr/>	

<i>D. c.</i>	<i>D. c.</i>	<i>D. c.</i>
8, 74	7, 69	9, 84
5	6	7
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

5. What will 8 cords of wood come to :
dollars 50 cents a cord? *Answer 36.*

6. Calculate the amount of 9 bushels of w.
at 1 dol. 25 cents a bushel. *Facit 11dol.*

7. Tell the amount of 10*lb.* of beef at
cents a *lb.* *Facit 1 dol. 2*

8. How much for 12*lb.* of cheese at
cents a *lb.*? *Answer 7 dol.*

9. What is the amount of 7 yards of c
at 5 dollars 50 cents a yard? *Ans. 38D.*

When the multiplier consists of several figures work by

RULE 2.

Use each figure of the multiplier separately as in the foregoing examples, and add the products together, placing the point in the total as before.

PROOF.

As in multiplication of integers, under rule 2.

EXAMPLES.

	<i>D. c.</i>	
1 Multiply	9, 47	31
by	31	9, 47
	<hr style="width: 50%; margin: 0;"/>	<hr style="width: 50%; margin: 0;"/>
	9 47	2 17
	284 1	12 4
	<hr style="width: 50%; margin: 0;"/>	<hr style="width: 50%; margin: 0;"/>
Product	293, 57	279
	<hr style="width: 50%; margin: 0;"/> <hr style="width: 50%; margin: 0;"/>	<hr style="width: 50%; margin: 0;"/> <hr style="width: 50%; margin: 0;"/>
	Proof 293, 57	

2 Multiply 1*D.* 12½*c.* by 319.

Facit 358*D.* 87*c.* 5*m.*

3 Multiply 3*D.* 75*c.* by 633.

Facit 2373*D.* 75*c.*

4. What will 112*lb.* of loaf sugar come to at 16 cents a *lb*?

Answer 29*D.* 12*c.*

5. Calculate the amount of 217 barrels of flour at 6 dollars 75 cents a barrel.

Facit 1464D. 75c.

6. Bought 175 bushels of corn, at 76 cents a bushel, what is the amount?

Answer 133D.

Note. Ciphers that stand to the right of the factors may be omitted as in integers, placing as many to the right of the product, and pointing as before.

1. How much will 130lb. of tea come to at 1D. 80c. a lb? *Answer 234D.*

2. Sold 1300lb. of coffee at 23 cents a lb. what is the amount? *Answer 299D.*

3. What will 120 gallons of wine come to at 1D. 10c. a gallon? *Answer 132D.*

When the multiplier is the product of two figures not exceeding 12, the sum may be done by

RULE 3.

Multiply the given sum, or price of an integer, by one of the said figures, and that product by the other, pointing the last product as in the foregoing examples.

PROOF.

Repeat the operation with the factors transposed; the result will equal the product of the sum.

EXAMPLES.

1 Multiply 7D. 37c. by 48

D. c. D. c.

7, 37	7, 37
6	8

44 22	58 96
8	6

Product 353, 76 Proof 353, 76

2 Multiply 9D 84c by 72 *Facit* 708D 48c3 Multiply 11D 66c by 84 *Facit* 979D 44c4 Multiply 1D 75c by 96 *Facit* 168D5 Multiply 2D 9c by 99 *Facit* 206D 91c6 How much will 32 yards of linen cost, at 75 cents a yard? *Answer* 24D.7 What is the worth of 36 yards of cloth, at 5 dollars 50 cents a yard? *Answer* 198D.

8 Calculate the amount of 144 barrels of flour at 6 dollars 20 cents a barrel.

Answer 892D. 80c.

9 What is the amount of 84 bushels of wheat at 1 dollar 12½ cents a bushel?

Answer 94D. 50c.

10 How much will 132 pieces of linen come to, at 17 dollars 37½ cents a piece?

Answer 2293½D.

DIVISION OF FEDERAL MONEY.

Division of federal money teaches to divide sums in its several denominations; also to find the price of an integer, when a quantity and its value in dollars, &c. are given.

When the divisor does not exceed 12, work by

RULE 1.

Divide the given sum as in integers, placing the point in the quotient under that of the dividend;—if a remainder occur, when there is not three places in the dividend to the right of dollars, annex ciphers to supply the defect; then divide as before.

PROOF.

Multiply the quotient by the divisor, adding in the remainder, if any, the product will equal the dividend.

EXAMPLES.

1 Divide 4*D.* 37*c.* by 2

D. c.

2 $\overline{)4\ 370}$

Quotient 2, 185
 2

Proof $\underline{\underline{4\ 370}}$

2 Divide 9D. 64 cents by 3

Facit 3D. 21c. 3m. + 1.

3 Divide 6D. 72 cents by 6

Facit 1D. 12c.

4 Divide 9D. 75 cents by 7

Facit 1D. 39c. 2m. + 6.

5 Divide 12D. 64 cents 9 mills by 9

Facit 1D. 40c. 5m. + 4.

6 Bought 9 cords of wood for 38 dollars 25 cents, how much was it a cord? *Ans.* 4D. 25c.

7 A labourer received 60 dollars for eight months service, how much was that a month?

Answer 7D. 50c.

Note 1. When the divisor is the product of two factors not exceeding 12, divide first by either of them as in the preceding sums, and that quotient by the other—the last quotient will be that required.

PROOF.

Repeat the operation with the divisors transposed.

EXAMPLES.

1 Divide 248 Dol. by 32

Dol.
4)248

8)62, 00

Facit 7, 75

Dol.
8)248

4)31, 00

Proof 7, 75

Note 2. If remainders occur, see 1
division of integers.

EXAMPLES.

6 Divide 175 Dol. 37 cents 5 mill.	
<i>d. c. m.</i>	<i>d. c. m.</i>
12)175.37 5	6)175, 37 5
<hr/>	
6) 14 61 4 + 7	12)29 22.9
<hr/>	<hr/>
2. 43 5 + 4	55R. Proof 2. 43 5
<hr/>	<hr/>

7 Divide 167 dollars 74 cents by
Facit 1D. 99c. 6

8 Divide 719 dollars 19 cents 5 mi

When the divisor exceeds 12 and is not the product of two figures in the table, work by

RULE 2.

Seek how often the divisor is contained in the left hand figures of the given sum, as taught in integers: place the result for the first of the quotient; multiply, subtract and bring down the next dividend figure, which divide as before &c. the quotient having as many figures separated to the right, as stand after dollars in the dividend, is the answer.

PROOF.

Multiply the quotient by the divisor, adding in the remainder; if any, and if right the quotient will be equivalent to the dividend.

EXAMPLES.

1 Divide 97 dollars. 75 cents by 23

D. c. D. c.

D. c.

23)97, 75(4, 25

4, 25

92

23

57

1275

46

850

115

Proof 97, 75

115

2 Divide 34D. 51 cents by 29 *Facit 1D. 19c.*

3 Divide 11D. 57 cents 4 mills by 31

Facit 37c. 3m. + 11.

4 Divide 139D. 92 cents by 53 *Facit 2D. 64c.*

5 Divide 130D. 65 cents by 67 *Facit 1D. 95c.*

6 Divide 114D. 20 cents by 71

Facit 1D. 60c. 8m. + 32.

7 Divide 120D. 480 mills by 96

Facit 1D. 25c. 5m.

8 Bought 103 bushels of wheat, which cost 225 dollars 57 cents; how much is that a bushel?

Answer 2 dollars 19 cents.

Promiscuous Examples

IN FEDERAL MONEY.

1. What number of dollars is there in 35000 cents?

2. Add together the following sums, viz. 5D. 27c. 19D. 75c. 5m. 37D. 9c. and twenty five dollars, eight dimes, four cents, and five mills.

3. What is the difference between one hundred and seventy five dollars, and thirty nine dollars, seventy five cents?

4. Bought seven cords of wood at 5D. 50c. a cord, what comes it to?

5. Sold 36 barrels of flour for 8D. 75 cents a barrel, what is the amount?

6. What will 795 bushels of corn come to, at 87 cents 5 mills a bushel?

7. Calculate the amount of 17000 bushels of coal, at 40 cents a bushel.

8. Paid 38 dollars 50 cents for 7 yards of superfine broad cloth, what was it a yard?

9. If 21 reams of paper cost 89 dollars 25 cents, what is that a ream?

10. Bought a piece of linen, containing 37 yards, for 32 dollars $37\frac{1}{3}$ cents, how much was that a yard?

11. What number of cents are there in one hundred seventy-five dollars twenty-five cents?

12. Calculate the amount of 7527 pieces of nankeen, at one dollar five cents a piece.

13. *AGROCER'S BILL.*

Philadel. 1mo. 2d. 1805.

A B.

Bo't of C. D.

12lb. coffee at 27c. a lb.

18lb. sugar at $12\frac{1}{2}$ c. —

27lb. loaf do. at $31\frac{1}{4}$ c. —

34lb. rice at 5c. —

Amount Dols. _____

B

*Federal Money.*14. *A STATIONER'S BILL.*

Philadel. 1mo. 5th. 180
 I. D. Bo't of G. H.

D. c.

3 reams paper at	3 20
7 hund. quills at	1 50
2 Comly's Gramm. at	50
5 Testaments at	37½

Amount Dols.

15. *MARKETING.**cents.*

18lb. beef at	12½ a lb.
3 bu. potatoes at	54 a bushel
4 bu. turnips at	27 —
7 bu. apples at	62½ —
2 pair fowls at	37½ a pair
27lb. butter at	25 a lb.

Amount Dols.

16. SHOPPING.

Bought at fundry times as follows, viz,

D. c.

5 yds. linen at	62 $\frac{1}{2}$	a yard
24 yds. coating	2 37 $\frac{1}{4}$	—
26 yds. brown cloth	1 87 $\frac{1}{2}$	—
123 yds. dowlas at	12 $\frac{1}{2}$	—
38 yds. carpeting at	80	—

Amount Dols.

17. A MILLINER'S BILL.

J. D. Philadel. 1mo. 12th. 1805
Bo't of A. B.

D. c.

14 yds. ribbon at	18 $\frac{3}{4}$	a yard
3 pair gloves at	27	a pair
13 fans at	13 $\frac{1}{2}$	each
2 pair knots at	25	a pair
19 yds. lace at	2 37 $\frac{1}{2}$	a yard

Amount Dols.

MONEY.

The Denominations are :

4 farthings marked <i>qr.</i>	make	1 penny	-
12 pence	-	1 shilling	-
20 shillings	-	1 pound	-

Note. *The farthings are written thus—*

$\frac{1}{4}$ one farthing.

$\frac{1}{2}$ two farthings, or a halfpenny.

$\frac{3}{4}$ three farthings.

PENCE TABLE. TABLE OF SHILLINGS

<i>d.</i>	<i>s.</i>	<i>d.</i>	<i>s.</i>	<i>£.</i>
20 pence make	1	8	20 shillings make	1
30 - - -	2	6	30 - - -	1 1
40 - - -	3	4	40 - - -	2
50 - - -	4	2	50 - - -	2 1
60 - - -	5	0	60 - - -	3
70 - - -	5	10	70 - - -	3 1
80 - - -	6	8	80 - - -	4
90 - - -	7	6	90 - - -	4 1
100 - - -	8	4	100 - - -	5
110 - - -	9	2	110 - - -	5 1
120 - - -	10	0	120 - - -	6
240 - - -	20	0	130 - - -	6 1

REDUCTION OF MONEY.

When the sum is to be reduced to a greater name work by

RULE 1.

Divide the given sum by that number of its own name, which makes one of the next greater: remainders retain the names of their respective dividendes.

EXAMPLES.

1. In 3846 farthings how many pounds?

$$\begin{array}{r}
 \text{qrs.} \\
 4 \overline{)3846} \\
 \hline
 12 \overline{)961} + 2 \text{qrs.} \\
 \hline
 2 \overline{)0810} + 1 \text{d.} \\
 \hline
 \end{array}$$

Answer $\underline{\underline{\pounds.401\frac{1}{2}}}$

2. How many pence in 24 farthings?

Answer 6d.

3. Reduce 36 farthings to pence. *Facit* 9d.

4. Reduce 39 pence to shillings. *Facit* 3s. 3d.

5. What number of shillings are there in 72 pence?

Answer 6s.

6. In 45 shillings how many pounds?

Answer $\pounds.250$.

7. In 120 shillings how many pounds?
Answer £.6 0
8. What number of pounds in 2880 pence
Answer £.12 0
9. How many pounds in 248 groats?
Answer £.4 2
10. In 24 six pences how many shillings
Answer 1
11. Reduce 100 three pences to shilling
Facit 2
12. Reduce 806 three pences to pounds.
Facit £.10 1
13. In 5827 farthings how many pounds
Answer £.6 1
14. In 624 six pences how many pounds
Answer £.15 12
15. How many shillings in 127 farthings
Answer 2s.
16. How many shillings in 119 pence?
Answer 9s. 1
17. Reduce 1776 pence to pounds.
Facit £.7 8
18. In 10825 farthings how many pounds
Answer £.11 5
19. Reduce 2776 pence to pounds.
Facit £.11 11
20. What number of pounds in 3054 pence
Answer £.12 14

When the sum is to be reduced to a lower name work by

RULE 2.

Multiply the given sum, or when of divers denominations its greatest name, by that number of the next lower denomination which makes one of that; taking the lower names of the given sum, if any, into the products of like denominations.

PROOF.

Rule 1. and 2. prove each other.

EXAMPLES.

1. In £.6 12 4 how many pence?

£. s. d.	d.
6 12 4	12) 1588
20	<hr/>
<hr/>	20) 132 + 4d.
132	<hr/>
12	Proof £.6 12 4
<hr/>	<hr/> <hr/>

Ans. 1588

2. How many shillings in 5 pounds?

Answer 100s.

3. In £.7 how many pence? *Answer 1680d.*

4. How many farthings in £.24?

Answer 23040qrs.

5. How many farthings in 2s. 7d. $\frac{3}{4}$

Answer 127qrs.

6. In 9s. 11d. how many pence?
Answer 119d.
7. Reduce £.7 8 to pence. *Facit 1776d.*
8. What number of pence in £.12 14 6?
Answer 3054d.
9. In £.17 10 6½ how many farthings?
Answer 16825grs.
10. Reduce £.37 10 to pence.
Facit 9000d.
11. What number of half pence is there in
£.11 5? *Answer 5400 half pence.*
12. In £.100 how many shillings?
Answer 2000s.

ADDITION OF MONEY.

Addition of money teaches to collect several sums into one sum.

RULE.

Place the numbers so, that those of the same denomination may stand directly under one another; then begin at the right hand column, and add up as in integers; reduce the total into the next greater name by rule 1. of reduction; set down the remainder and carry the quotient to the next column, and so proceed.

PROOF.

Perform the addition downward.

EXAMPLES.

$$\begin{array}{r} \text{£. s. d.} \\ 12 \quad 4 \quad 6 \\ 3 \quad 9 \quad 9 \\ 19 \quad 12 \quad 3 \\ \hline \end{array}$$

$$\hline 35 \quad 6 \quad 6$$

$$\begin{array}{r} \text{£. s. d.} \\ 13 \quad 13 \quad 4 \\ 19 \quad 6 \quad 3 \\ 7 \quad 9 \quad 11 \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 4 \quad 2 \quad 4\frac{1}{2} \\ 1 \quad 3 \quad 7\frac{3}{4} \\ 3 \quad 19 \quad 6\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 7 \quad 12 \quad 4\frac{1}{2} \\ 3 \quad 16 \quad 7\frac{3}{4} \\ 19 \quad 9 \quad 2\frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 12 \quad 12 \quad 1\frac{1}{2} \\ 16 \quad 19 \quad 6\frac{1}{4} \\ 9 \quad 12 \quad 7\frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 12 \quad 6 \quad 9 \\ 11 \quad 11 \quad 6 \\ 12 \quad 18 \quad 9 \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 17 \quad 1 \quad 9\frac{3}{4} \\ 19 \quad 11 \quad 4\frac{1}{2} \\ 6 \quad 19 \quad 7\frac{1}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 11 \quad 6 \quad 9\frac{1}{4} \\ 12 \quad 9 \quad 7\frac{1}{2} \\ 19 \quad 2 \quad 6\frac{3}{4} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 12 \quad 4 \quad 6 \\ 19 \quad 11 \\ 17 \quad 6 \quad 3 \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 112 \quad 6 \quad 9 \\ 376 \quad 9 \quad 8\frac{1}{2} \\ 719 \quad 19 \quad 6\frac{3}{4} \\ 96 \quad 13 \quad 9\frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 376 \quad 11 \quad 9\frac{3}{4} \\ 623 \quad 8 \quad 2\frac{1}{4} \\ 976 \quad 18 \quad 11\frac{1}{2} \\ 23 \quad 11 \quad 0\frac{1}{2} \\ \hline \end{array}$$

$$\begin{array}{r} \text{£. s. d.} \\ 276 \quad 6 \quad 4\frac{3}{4} \\ 723 \quad 13 \quad 7\frac{1}{2} \\ 964 \quad 12 \quad 9\frac{1}{4} \\ 137 \quad 9 \quad 6\frac{3}{4} \\ \hline \end{array}$$

£.	s.	d.	£.	s.	d.	£.	s.	d.
376	19	6 $\frac{3}{4}$	377	12	9	124	11	6 $\frac{1}{2}$
623	0	5 $\frac{1}{4}$	622	7	3	875	8	3 $\frac{1}{2}$
496	12	7	99	6	7 $\frac{1}{4}$	612	12	4
324	6	9 $\frac{1}{2}$	716	11	6 $\frac{1}{2}$	764	9	6 $\frac{1}{4}$

£.	s.	d.	£.	s.	d.	£.	s.	d.
136	12	11	762	10	6 $\frac{3}{4}$	764	10	9
863	7	1	237	9	5 $\frac{1}{4}$	276	9	6
379	13	9 $\frac{3}{4}$	716	12	11 $\frac{1}{2}$	397	16	2 $\frac{1}{2}$
216	11	4 $\frac{1}{2}$	179	16	10 $\frac{3}{4}$	996	19	4 $\frac{1}{4}$

1. Add £.0 19 6 $\frac{1}{4}$, £.7 11 3 $\frac{1}{2}$, £.11 12 4 $\frac{1}{2}$ and £.13 2 7 $\frac{1}{4}$ together. *Facit* £.33 5 9 $\frac{1}{2}$.

2. What is the amount of the following sums, viz. £.11 5 0, £.13 2 4 $\frac{1}{2}$, £.17 2 4 $\frac{3}{4}$, £.3 9 4 $\frac{1}{2}$, and £.0 13 4?

Answer £.45 12 5 $\frac{3}{4}$.

3. Suppose a man borrowed a sum of money, and paid in part at one time £.13 18 9, at another £.23 18 4 $\frac{3}{4}$, at a third time £.47 0 9, and the remainder is £.37 14 6 $\frac{1}{2}$; what was the sum borrowed? *Answer* £.122 12 5 $\frac{1}{4}$.

4. Bought three horses for £.16 17 4 each, and two cows for £.5 14 7 each, and three bushels of wheat for £.0 18 10 $\frac{1}{2}$, what is the amount? *Answer* £.63 0 0 $\frac{1}{2}$.

SUBTRACTION OF MONEY.

Subtraction of money teaches to take a sum from a greater, and shews the difference.

RULE.

Place the sums as in addition, and with the less under the greater; then begin at the right hand, and take the under from the upper; but when the lower number is greater than the upper, take it from as many of that denomination as make one of the next greater, and to the remainder add the upper number; set down the result and carry one to the next name, &c.

PROOF.

The amount of the remainder and the less sum, will equal the greater.

EXAMPLES.

	<i>L.</i>	<i>s.</i>	<i>d.</i>	<i>L.</i>	<i>s.</i>	<i>d.</i>	<i>L.</i>	<i>s.</i>	<i>d.</i>
From	13	2	4 $\frac{1}{4}$	19	16	5 $\frac{3}{4}$	16	11	4 $\frac{1}{4}$
Take	9	16	7 $\frac{1}{2}$	11	17	9	9	12	9 $\frac{1}{2}$
	<hr/>			<hr/>			<hr/>		
Rem.	3	5	8 $\frac{3}{4}$						
	<hr/>			<hr/>			<hr/>		
Proof	13	2	4 $\frac{1}{4}$						
	<hr/>			<hr/>			<hr/>		

L. s. d.	L. s. d.	L. s. d.
9 3 6 $\frac{1}{2}$	11 16 9 $\frac{3}{4}$	7 13 4 $\frac{1}{4}$
2 17 9 $\frac{3}{4}$	9 17 8 $\frac{1}{4}$	1 19 9 $\frac{1}{2}$
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

L. s. d.	L. s. d.	L. s. d.
13 16 7 $\frac{1}{4}$	19 19 1 $\frac{1}{4}$	3 13 7 $\frac{1}{2}$
9 19 1 $\frac{1}{2}$	9 19 7 $\frac{1}{2}$	1 19 9 $\frac{3}{4}$
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

L. s. d.	L. s. d.	L. s. d.
27 17 4 $\frac{1}{4}$	39 11 2 $\frac{1}{2}$	14 2 1 $\frac{1}{4}$
19 16 9 $\frac{3}{4}$	16 14 9 $\frac{3}{4}$	9 6 9 $\frac{1}{2}$
<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>

1. From £.19 7 9 $\frac{1}{2}$ take £.7 19 4 $\frac{3}{4}$.

Facit £.11 8 4 $\frac{3}{4}$.

2. What difference is there between

£.3 7 9 $\frac{1}{2}$, and £.1 19 7 $\frac{3}{4}$? *Ans.* £.1 8 1 $\frac{3}{4}$.

3. Subtract £.2 7 4 $\frac{1}{4}$ from £.9 3 11 $\frac{1}{2}$.

Facit £.6 16 7 $\frac{1}{4}$.

4. Out of £.19 11 7 $\frac{1}{4}$ take £.17 0 7 $\frac{1}{4}$.

Facit £.2 10 11 $\frac{1}{2}$.

5. A and B have each a sum of money; A's sum, which is the greatest, is £.74 17 0, and the difference is £.49 13 6, what has B?

Answer £.25 3 6.

6. Paid A B for C D's bill of £.75, viz. gave him R. Drawer's note for £.7 12 6, P. Johnson's ditto for £.5, an assignment on R. Dealer for £.17 13 9½, and in bank notes £.40. how much cash will make up the deficiency?

Answer £.4 13 8½

MULTIPLICATION OF MONEY.

Multiplication of money teaches to find a sum equal to another, taking any proposed number of times; also to find the amount of any quantity at the given price of an integer.

When the multiplier, or given quantity, does not exceed 12, work by

RULE 1.

Place the multiplier under the lowest denomination of the given sum, and multiply as in integers; reduce the product to the next greater name by rule 1. of reduction; set down the remainder, if any, underneath, and carry the quotient to the product of the next denomination, and so proceed.

PROOF.

Multiply as before, and set down the result of each reduction, under like names in the

E.

given sum, the amount of these products will equal the product of the sum.

EXAMPLES.

$$\begin{array}{r} L. \quad s. \quad d. \\ 11 \quad 19 \quad 7 \\ \quad \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} 23 \quad 19 \quad 2 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 11 \quad 19 \quad 7 \\ \quad \quad 2 \\ \hline \end{array}$$

$$\begin{array}{r} \quad \quad 1 \quad 2 \\ 1 \quad 18 \\ \hline 22 \end{array}$$

Proof $23 \quad 19 \quad 2$

$$\begin{array}{r} L. \quad s. \quad d. \\ 6 \quad 17 \quad 2\frac{1}{4} \\ \quad \quad 4 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 7 \quad 16 \quad 9\frac{1}{2} \\ \quad \quad 5 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 11 \quad 19 \quad 7\frac{1}{4} \\ \quad \quad 6 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 19 \quad 15 \quad 3\frac{1}{2} \\ \quad \quad 7 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 61 \quad 17 \quad 4\frac{1}{4} \\ \quad \quad 8 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 16 \quad 17 \quad 9\frac{1}{4} \\ \quad \quad 9 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 74 \quad 11 \quad 6\frac{1}{4} \\ \quad \quad 10 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 13 \quad 13 \quad 1\frac{1}{4} \\ \quad \quad 11 \\ \hline \hline \end{array}$$

$$\begin{array}{r} L. \quad s. \quad d. \\ 7 \quad 19 \quad 11\frac{1}{4} \\ \quad \quad 12 \\ \hline \hline \end{array}$$

1. What will 5 yards of broad cloth come to at £.2 5 0 a yard? *Answer* £.11 5 0.

2. How much for 12 gallons of wine at 9s. 6d. a gallon? *Answer* £.5 14 0.

3. Calculate the amount of 11C. wt. of beef at £.1 11 5 a C. wt. *Facit* £.17 5 7.

4. Bought 12 gallons of spermaceti oil at 9s. 6d. a gallon; what does it come to?

Answer £.5 14 0.

5. What will 9C. wt. of flour come to at £.1 11 5 a C. wt.? *Answer* £.14 2 9.

6. What cost 6 reams of paper at £.1 5 0 a ream? *Answer* £.7 10 0.

7. Bought 4 barrels of beer, at £.2 5 0 a barrel, what come they to?

Answer £.9 0 0.

8. Sold 10 tons of hay at £.8 12 6 a ton, what is the amount? *Answer* £.86 5 0.

When the given quantity is the product of two figures not exceeding 12, work by

RULE 2.

Multiply the given sum or price of an integer by one of said figures, and that product by the other.

PROOF.

Repeat the operation with the factors changed, the result will equal the product of the sum.

EXAMPLES.

1. Multiply £.4 7 9½ by 27

£. s. d.

4 7 9½

3 × 9 = 27

13 3 4½

9

£. s. d.

4 7 9½

9 × 3 = 27

39 10 1½

3

Fa. £. 118 10 4½ Proof £. 118 10 4½

- | | £. | s. | d. | | £. | s. | d. |
|---------|----|----|----|-------|-------|------|------|
| 2. Mul. | 1 | 16 | 4½ | by 28 | Facit | 50 | 18 6 |
| 3. Mul. | 4 | 12 | 6½ | by 32 | Facit | 148 | 0 8 |
| 4. Mul. | 5 | 9 | 9½ | by 36 | Facit | 197 | 13 3 |
| 5. Mul. | 8 | 13 | 2 | by 42 | Facit | 363 | 13 0 |
| 6. Mul. | 7 | 10 | 9½ | by 56 | Facit | 422 | 4 4 |
| 7. Mul. | 19 | 19 | 2½ | by 64 | Facit | 1277 | 8 0 |

8. What will 99 yards of Cassimere come to at 18s. 11½ a yard? Answer £.93 16 10½.

9. Calculate the amount of 144 reams of paper at 13s. 4d. a ream. Facit £.96 0 0.

10. Bought a piece of cloth containing 24 yds. at 15s. 3d. a yard; what comes it to?

Answer £.18 6 0.

11. Sold 96 bushels of Indian corn at 5s. 3½ a bushel; what is the amount?

Answer £.25 8 0.

12. Tell the amount of 72 yards of chintz at 4s. 9½ a yard. *Facit* £.17 5 0.

When the given quantity is not the product of any two factors in the multiplication table work by

RULE 3.

Use two such factors as will produce the nearest to the given quantity, and add or subtract for the deficiency or excess.

PROOF.

As under Rule 2.

EXAMPLES.

1. Multiply 3s. 8d. by 19

<i>s. d.</i>	<i>s. d.</i>
3 8 × 1	3 8 × 1
3 × 6 + 1 = 19	6 × 3 + 1 = 19
<hr/>	<hr/>
11 0	1 2 0
6	3
<hr/>	<hr/>
3 6 0	3 6 0
Add 3 8	3 8
<hr/>	<hr/>
<i>Facit</i> £ 3 9 8	<i>Proof</i> £.3 9 8
<hr/> <hr/>	<hr/> <hr/>
	E 2

	s.	d.		£.	s.	d.
2. Mul.	17	8	by 43	F.	37	19 8
3. Mul.	18	9	by 86	F.	80	12 6
4. Mul.		9½	by 58	F.	2	5 11
5. Mul.	1	4½	by 74	F.	5	1 9
6. Mul.	15	11½	by 76	F.	60	12 10
7. Mul.	£.8	7 0	by 78	F.	65	1 6 0
8. Mul.	£.1	2 1½	by 116	F.	128	6 6
9. Mul.	7	9½	by 148	F.	57	16 3
10. Mul.	4	3½	by 152	F.	32	12 4
11. What cost a chest of tea weighing 98lb.						
at 5s. 6d. a pound? Answer £.26 19s. 0d.						
12. How much for 109lb. of sugar at 1s. 1½						
a pound? Answer £.6 2s. 7½.						

When the given quantity is greater than the product of any two factors in the multiplication table work by

RULE 4.

Multiply continually by as many tens less one, as there are figures in the given quantity; then multiply the last product by the figure in the left of said quantity (if more than one;) again, multiply the given price by the units of the multiplier, the product of 10 by the tens, &c. and the sum of the several products will be the answer.

PROOF.

The given price doubled and multiplied as before, will equal the former product multiplied by 2.

EXAMPLES.

1. Multiply $6\frac{1}{2}d.$ by 276

$\begin{array}{r} d. \\ 6\frac{1}{2} \times 6 \\ \hline 10 \\ \hline 5 \ 5 \times 7 \\ \hline 10 \\ \hline 2 \ 14 \ 2 \\ \hline 2 \\ \hline 5 \ 8 \ 4 \\ 1 \ 17 \ 11 \\ \hline 3 \ 3 \\ \hline \text{Facit } £.7 \ 9 \ 6 \\ \hline 2 \\ \hline \end{array}$	$\begin{array}{r} d. \\ 6\frac{1}{2} \\ \hline 2 \\ \hline 1 \ 1 \times 6 \\ \hline 10 \\ \hline 10 \ 10 \times 7 \\ \hline 10 \\ \hline 5 \ 8 \ 4 \\ \hline 2 \\ \hline 10 \ 16 \ 8 \\ 3 \ 15 \ 10 \\ \hline 6 \ 6 \\ \hline \end{array}$
$\begin{array}{r} £.14 \ 19 \ 0 \\ \hline \hline \end{array}$	$\begin{array}{r} \text{Proof } £.14 \ 19 \ 0 \\ \hline \hline \end{array}$

- | <i>d. s.</i> | <i>£. s. d.</i> |
|--|--|
| 2. Mul. 1 2 by 195 | <i>Facit</i> 11 7 6 |
| 3. Mul. 3 3 by 407 | <i>Facit</i> 66 2 9 |
| 4. Mul. 14 3 by 875 | <i>Facit</i> 623 8 9 |
| 5. What is the amount of 336 yards of linen at 2s. 5d. a yard? | <i>Answer</i> £.40 12 0. |
| 6. What will 350lb. of sugar come to at $11\frac{1}{4}d.$ a lb.? | <i>Answer</i> £.17 2 9 $\frac{1}{4}$. |

7. If 240 acres of land be let at 14s. 6d. ~~an~~ acre, what is the yearly rent of the whole?

Answer £.174 0 0.

8. If a person expend 32s. 6d. a day, and lay up annually £.294 12 6, what is his yearly income?

Answer £.887 15 0.

9. Suppose a person's annual income be £.500 and he expend daily 19s. 11d. what does he lay up at the year's end?

Answer £.136 10 5.

DIVISION OF MONEY.

This rule teaches to divide money in its several denominations; also to find the price of an integer when a quantity and its value are given.

When the divisor does not exceed 12 work by

RULE 1.

Divide the greatest name of the given sum as integers, by rule 1.—If any remain, reduce and add it, to the next lower denomination by rule 2. of reduction—divide the result as before, and so proceed.

PROOF.

By multiplication of money rule 1.

EXAMPLES.

1. Divide £.16 17 8 $\frac{1}{2}$ by 7.

$$\begin{array}{r} \text{£. s. d.} \\ 7 \overline{) 16 \ 17 \ 8\frac{1}{2}} \end{array}$$

$$\text{Facit} \quad 2 \ 8 \ 2\frac{1}{2} + 5$$

$$\text{Proof } \underline{\underline{\underline{£. 16 \ 17 \ 8\frac{1}{2}}}} \quad \underline{\underline{\underline{7}}}$$

- | | £. | s. | d. | | £. | s. | d. |
|-----------|----|----|-----------------|-------|-------|----|--------------------|
| 2. Divide | 1 | 8 | 4 | by 5 | Facit | 0 | 5 8 |
| 3. Divide | 3 | 19 | 9 $\frac{1}{4}$ | by 7 | Facit | 0 | 11 4 $\frac{3}{4}$ |
| 4. Divide | 4 | 8 | 6 | by 9 | Facit | 0 | 9 10 |
| 5. Divide | 3 | 15 | 0 | by 10 | Facit | 0 | 7 6 |
| 6. Divide | 11 | 11 | 3 | by 6 | Facit | 1 | 18 6 $\frac{1}{2}$ |

7. Bought 4 bushels of salt for 17s. 6d. what was it a bushel? *Answer* 4s. 4d $\frac{1}{2}$.

8. Sold 8 yards of linen for £.3 11 8, what was the price a yard? *Answer* 8s. 11d $\frac{1}{4}$.

9. A labourer had £.3 3 0 for 12 days service, what was that by the day?

Answer 5s. 3d.

Note 1. When the divisor, or given quantity, is the product of two factors not exceeding 12, divide first by either of them as in the preceding examples, and the quotient by the other; the last quotient will be that required.

PROOF.

Repeat the operation with the divisors transposed.

EXAMPLES.

1. Divide £.39 by 24

<table border="0" style="margin: auto;"> <tr><td></td><td><i>L.</i></td><td><i>s.</i></td><td><i>d.</i></td></tr> <tr><td>4)</td><td>39</td><td>0</td><td>0</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>6)</td><td>9</td><td>15</td><td>0</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td><i>Facit</i></td><td>1</td><td>12</td><td>6</td></tr> <tr><td colspan="4"><hr/></td></tr> </table>		<i>L.</i>	<i>s.</i>	<i>d.</i>	4)	39	0	0	<hr/>				6)	9	15	0	<hr/>				<i>Facit</i>	1	12	6	<hr/>				<table border="0" style="margin: auto;"> <tr><td></td><td><i>L.</i></td><td><i>s.</i></td><td><i>d.</i></td></tr> <tr><td>6)</td><td>39</td><td>0</td><td>0</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td>4)</td><td>6</td><td>10</td><td>0</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td><i>Proof</i></td><td>1</td><td>12</td><td>6</td></tr> <tr><td colspan="4"><hr/></td></tr> </table>		<i>L.</i>	<i>s.</i>	<i>d.</i>	6)	39	0	0	<hr/>				4)	6	10	0	<hr/>				<i>Proof</i>	1	12	6	<hr/>			
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L. s. d. *L. s. d.*

2. Divide 3 10 10½ by 27 *Facit* 0 2 9
3. Divide 372 16 0 by 96 *Facit* 3 17 8
4. Divide 225 0 0 by 120 *Facit* 1 17 6
5. Divide 474 0 0 by 72 *Facit* 6 11 8
6. If 24 yards of cloth cost £.18 6 0, the price of one yard is required. *Facit* 15s. 3d.
7. What is wheat a bushel, when 42 bushels sells for £.17 13 6? *Answer* 8s. 5d.
8. When 100 gallons of wine are sold for £.83 6 8, what is a gallon worth?
Answer. 16s 8d.

Note 2. When remainders occur, see note 2. in division of integers.

EXAMPLES.

9. Divide £.72 10 7½ by 24
 L. s. d. L. s. d.

$$\begin{array}{r} 4 \overline{) 72 \ 16 \ 7\frac{1}{2}} \\ \hline \end{array}$$

$$\begin{array}{r} 6 \overline{) 72 \ 16 \ 7\frac{1}{2}} \\ \hline \end{array}$$

$$\left. \begin{array}{l} 6 \overline{) 18 \ 4 \ 1\frac{3}{4} + 2} \\ \hline \end{array} \right\} 6 \text{ R. } \frac{1}{2}$$

$$\left. \begin{array}{l} 4 \overline{) 12 \ 2 \ 9\frac{1}{2}} \\ \hline \end{array} \right\} 6 \text{ R. } \frac{1}{2}$$

$$\text{Fac. } \underline{\underline{£.3 \ 0 \ 8\frac{1}{4} + 1}} \quad \text{Prf. } \underline{\underline{£.3 \ 0 \ 8\frac{1}{4} + 1}}$$

10. Divide £.173 14 7 by 16
Facit £.10 17 1¼ + 12.
11. Divide £.137 10 by 84
Facit £.1 12 8 + 72.
12. Divide £.256 15 10 by 144
Facit £.1 15 7¼ + 136.

When the dividing number is more than 12, and not the product of two factors in the multiplication table work by

RULE 2.

Divide the greatest denomination of the given sum by said number as integers, by rule 2; reducing remainders to the next lower names, &c. as taught in the preceding rules.

PROOF.

Multiply the quotient into the divisor, by rule 3. or 4. of multiplication of money.

EXAMPLES.

1. Divide £.63 6 8 by 19

<i>L. s. d.</i>	<i>L. s. d.</i>
19)63 6 8(3 6 8 Quotient	
57	
—	
6	<i>L. s. d.</i>
20	3 6 8 × 1
—	6 × 3 + 1 = 19
19)126(6s.	20 0 0
114	3
—	—
12	60 0 0
12	3 6 8
—	—
19)152(8d. Proof 63 6 8	
152	
—	
...	
—	

- | <i>L. s. d.</i> | <i>L. s. d.</i> |
|--|-----------------------------------|
| 2. Divide 6 6 8 by 38 | <i>Fct.</i> 0 3 4 |
| 3. Divide 46 17 4 by 74 | <i>Fct.</i> 0 12 8 |
| 4. Divide 310 12 0 $\frac{1}{2}$ by 106 | <i>Fct.</i> 2 18 7 $\frac{1}{2}$ |
| 5. Divide 3236 12 4 $\frac{1}{2}$ by 654 | <i>Fct.</i> 4 18 11 $\frac{3}{4}$ |
| 6. If 58lb. of sugar be sold for £.2 5 11, what is that a lb.? | <i>Answer</i> 9 $\frac{1}{2}$ d. |
| 7. Bought 230 bushels of salt for £.26 16 8, what was it a bushel? | <i>Answer</i> 2s. 4d. |

8. If 814lb. of double refined sugar cost £.66 29, what is it by the lb.? *Ans.* 1s. 7½d.

9. The annual rent of an estate is £.118 12 6, how much is that a day? *Answer* 6s. 6d.

Promiscuous Examples

IN MONEY.

1. Reduce £.125 10 6 to pence. -
2. What number of pounds is there in 120000 pence?
3. Tell the amount of thirty three pounds five and nine pence, five pounds twelve shillings and six pence, and seventeen pounds ten shillings and three pence three farthings.
4. Subtract nine shillings and seven pence half penny from ten pounds.
5. Bought five tons of hay, at seven pounds ten and six pence a ton, what is the amount?
6. Calculate the amount of 36 bushels of wheat, at 13 shillings 4 pence a bushel.
7. Sold 65 yards of carpeting, at 6s. 4½ pence a yard, what comes it to?
8. What is the value of 1256 bushels of barley, at 6 shillings and 9 pence a bushel?
9. If nine thousand bricks cost £.23 12 6, how much is that a thousand?
10. Bought 27 casks of wine for £.324, what was that for each cask?

11. Having sold a parcel of cloth, containing 132 yards, for £.221 18 6, find the cost of one yard.

12. What is coffee a pound when 112 pounds cost £.12 7 4?

13. A MERCER'S BILL.

H. R. *Philadel. 1mo. 1st. 1805.*
Bo't of S. W.

	s.	d.	
9 yards of silk at	14	6	a yard
16 yards farfenet at	6	9	—
27 yards fattin at	9	6	—
32 yards lustring at	5	7 $\frac{1}{2}$	—

Amount £.

14. A WOOLLEN DRAPER'S BILL.

A. B. *Philadel. 1mo. 5th. 1805.*
Bo't of C. D.

	s.	d.	
7 yards coating at	17	6	a yard
18 yards broad cloth at	45	9	—
23 yards cassimere at	18	4 $\frac{1}{2}$	—
107 yards drugget at	9	6	—

Amount £.

15. *A GROCER's BILL.*

Philadel. 12mo. 15th. 1805.
W. M.

Bo't of B. R.

6lb. cinnamon at 7s. 9d. a lb.
13 oz. nutmegs at 9s. 4½d. —
7 loaves of fugar,
weight 49lb. at 2s. 1d. —
310lb. coffee at 1s. 7d. —
2 casks of Lisbon wine
containing 59 gal. at 5s. 7½d. a gal.

Amount £.

16 *AN IRONMONGER's BILL.*

Philadel. 1mo. 10th. 1805.
T.M.

Bo't of W. L. & Co.

6 C. wt. of bar iron at £.1 17s. 6d. a C. wt.
84lb. Crowley's steel at 16s. 6d. a lb.
700lb. of rowled iron at 7d. a lb.
1200lb. cut nails at 11½d. —

Amount £.

17. *A LUMBER BILL.*

B. Builder *Philad. 2mo. 15th. 1805.*
Bo't of D. C. & Co.

1300 ft. of scantling at $4\frac{1}{2}d$ a foot

978 ft. of lath at $1\frac{1}{2}d$. —

9000 ft. of white pine boards at $2\frac{1}{2}d$. —

40000 cedar shingles at £.7 2s. 6d. a thousf.

Amount £.

18. What is the amount of 72000 bricks, at 7 dollars a thousand, 4000 ditto, at 5 dollars 50 cents, and 96 bushels of lime at 50 cents a bushel?

WEIGHTS AND MEASURES.

See their several uses under their respective heads.

REDUCTION OF WEIGHTS AND MEASURES.

When numbers or quantities are to be reduced to a greater name, work by

RULE 1.

Divide by that number of its own name, which makes one of the next greater.

Reduction of Weights & Measures. 71

But if required to reduce quantities to a lower name, work by

RULE 2.

Multiply by that number of the next lower name, which makes one of that, &c. taking the lower denominations of the given number, when compound, into the products of like name,

PROOF.

Reduce the result of the operation back to its given name,

TROY WEIGHT.

By this weight jewels, gold, silver and liquors are weighed.

The Denominations are :

24 grains (<i>grs.</i>)	make 1 pennyweight,	<i>dwt.</i>
20 pennyweight	1 ounce,	<i>oz.</i>
12 ounces	1 pound,	<i>lb.</i>

EXAMPLES.

1. Reduce 2627 pennyweights to pounds.

	<i>dwt.</i>		<i>lb. oz. dwt.</i>
Rule 1.	2 0)262 7	Rule 2.	10 11 7
	<hr/>		12
	12)1310z.7dwt.		—
	<hr/>		131
Facit	10lb. 11oz. 7dwt.		20
	<hr/>		<hr/>
		Proof	2627dwt.
			<hr/>

2. Reduce 7991grs. to pounds.

Facit 1lb. 4oz. 12dwt. 23grs.

3. What number of grains is there in 15oz. of silver?

Answer 7200grs.

4. Reduce 4lb. 3oz. 19dwt. to pennyweights.

Facit 1039dwt.

5. How many pounds are there in 1200dwt.?

Answer 5lb.

6. In 9lb. 7oz. 10dwt. how many grains?

Answer 55440grs

AVOIRDUPOIS WEIGHT.

By this weight are weighed things of a coarse drossy nature, that are bought and sold by weight; and all metals but silver and gold.

The Denominations are :

16 drams, (dr.) make	1 ounce	oz.
16 ounces	1 pound	lb.
28 pounds	1 quarter of an C. wt.	qr.
4 quarters (112 lb.)	1 hundred weight	C. wt.
20 hundred weight	1 ton	T.

EXAMPLES.

1. Reduce 764 lb. to hundred weights.
Facit 6 C. wt. 3 qr. 8 lb.
2. In 9 C. wt. 1 qr. 5 lb. how many pounds?
Answer 1041 lb.
3. In 3 C. wt. 2 qr. 11 lb. how many pounds?
Answer 403 lb.
4. How many quarters are there in 317 lb.?
Answer 11 qr. 9 lb.
5. Reduce 67200 lb. to tons. *Facit* 30 tons.
6. In 6 casks of flour, weighing each 1 C. wt. 3 qr. how many pounds? *Answer* 1176 lb.

APOTHECARIES WEIGHT.

By this rule apothecaries mix their medicines, but buy and sell by *Avoirdupois weight*.

The Denominations are :

20 grains, (gr.) make	1 scruple	℥
3 scruples	1 dram	ʒ
8 drams	1 ounce	℥
12 ounces	1 pound	lb.

EXAMPLES.

1. In 1120grs. how many ounces?
Answer 2 $\frac{2}{3}$. 23. 29.
2. Reduce 6300grs. to pounds.
Facit 1lb. 1 $\frac{2}{3}$. 13.
3. In 1lb. how many scruples? *Ans.* 288 $\frac{1}{2}$.
4. How many grains are there in 2lb. 9 $\frac{3}{4}$?
Answer 16200grs.
5. In 5lb. of drugs how many parcels, each 16 drams?
Answer 30 parcels.
6. In 20 parcels of drugs, each weighing 24 drams, how many pounds? *Answer* 5lb.

LONG MEASURE.

Long Measure is used for lengths or distances.

The Denominations are :

3 barley-corns, (b. c.)	make 1 inch	<i>in</i>
12 inches	1 foot	<i>ft.</i>
3 feet	1 yard	<i>yd.</i>
5 $\frac{1}{2}$ yards (16 $\frac{1}{2}$ ft.)	1 rod, pole, or perch	<i>P.</i>
40 perches (220yds.)	1 furlong	<i>fur.</i>
8 furlongs (1760yds.)	1 mile	<i>M.</i>
3 miles	1 league	<i>L.</i>
60 geographic, or } 69 $\frac{1}{2}$ statute miles }	1 degree	<i>Deg.</i>

Note. A fathom is 6ft. and used only to measure the depth of water.

A hand, 4 inches, and used to measure the height of horses.

EXAMPLES.

1. Reduce 704 perches to miles.
Facit 2M. 1fur. 24P.
2. Reduce 2M. 1fur. 8P. 3yds. 2in. into inches.
Facit 136334in.
3. How many yards are therein 3M. 5fur.?
Answer 6380yds.
4. In $\frac{1}{2}$ L. 1M. 7fur. how many furlongs?
Answer 183fur.
5. How many miles are there in 7040 yards?
Answer 4M.
6. Reduce 69fur. to miles. *Facit 8M. 5fur.*

CLOTH-MEASURE.

By this measure, cloth, tapes, &c. are measured.

The Denominations are :

2 $\frac{1}{4}$ inches, (in.)	make 1 nail	<i>na.</i>
4 nails	1 quarter of a yard	<i>qr.</i>
4 quarters	1 yard	<i>yd.</i>
2 $\frac{1}{2}$ quarters (1ona.)	1 ell Hamburgh	<i>E. H.</i>
3 quarters	1 ell Flemish	<i>E. Fl.</i>
5 quarters	1 ell Eng. or French	<i>E. E.</i>

EXAMPLES.

1. In 1012 nails of cloth how many yards?
Answer 63yd. 1qr.
2. Reduce 73 ells Flemish to quarters.
Facit 21 $\frac{1}{2}$ qrs.

3. How many ells Flemish are in 1752na. ?

Answer 146E. F.

4. How many ells English are in 1408na. ?

Answer 70E. E. 2qr.

5. Reduce 17yds. 3qrs. to quarters.

Facit 71qr.

6. In 167 nails how many yards ?

Answer 10yds. 1qr. 3na.

7. Reduce 9 yards 1 quarter to nails.

Facit 148na.

8. In 4 bales of cloth, each 12 pieces, and in each piece 24 E. E. how many yards and ells Flemish ?

Answer 1440yds. 1920 ells Flemish.

LAND MEASURE.

This measure shews the quantity of land.

The Denominations are:

9 square feet, (ft.) make 1 yard		yd.
30 $\frac{1}{4}$ yards	1 perch	P.
40 perches	1 rood	R.
4 roods	1 acre	A.

EXAMPLES.

1. Reduce 4392 perches into acres.

Facit 27A. 1R. 32P.

2. Reduce 11A. 2R. 19P. into perches.

Facit 1859P.

3. How many perches in 12A. 1R. 7P.?

Facit 1967P.

4. Reduce 674R. to acres. *Facit* 168A. 2R.

5. In 17A. 3R. 26P. how many perches?

Answer 2866P.

6. In 3200 perches of land how many acres?

Answer 20 acres.

LIQUID MEASURE.

This measure is used for beer, cider, wine, &c.

The Denominations are :

2 pints, (pts.)	make 1 quart	qt.
4 quarts	1 gallon	gal.
63 gallons	1 hoghead	hhd.
2 hogheads	1 pipe or butt	p. b.
2 pipes (4hhd.)	1 ton	T.

Note. By a law of Pennsylvania, 16 gallons make one half barrel ; $31\frac{1}{2}$ gallons one barrel ; 64 gallons one double barrel ; 84 gallons one puncheon ; 42 gallons one tierce.

EXAMPLES.

1. In 756 quarts how many hogheads?

Answer 3hhd.

2. In 11 barrels of beer how many quarts?

Answer 1386qts

3. Reduce 1008 pints to hogheads.

Facit 2hhd.

4. In 157 gallons 2 quarts how many
rels? *Answer*

5. How many barrels of beer are the
1321 pints? *Answer* 5bar. 7gal. 2qts.

6. Bring 7 hogheads to quarts.
Facit 176

DRY MEASURE.

This measure is used for grain, fruit,
&c.

The Denominations are :

2 pints (pt)	make 1 quart	qt.
8 quarts	1 peck	pe.
4 pecks	1 bushel	bu.

EXAMPLES.

1. In 5054 pints how many bushels?
Answer 78bu. 3pe.

2. Reduce 17 bushels 5 quarts to pints.
Facit 109

3. Reduce 448 quarts to bushels.
Facit 1

4. How many bushels are there in
quarts? *Ans.* 16bu. 3pe.

TIME.

The Denominations are :

60 seconds (<i>sec.</i>)	make 1 minute	<i>Min.</i>
60 minutes	1 hour	<i>H.</i>
24 hours	1 day	<i>D.</i>
7 days	1 week	<i>W.</i>
4 weeks	1 month	<i>Mo.</i>
13 months, 1 day and six hours, or 365 days and 6 hours	1 year	<i>Y.</i>

Note. A common year consists of 365 days,
and every fourth, called *leap-year*, of 366.

The year is also divided into 12 calendar months, as follow :

The fourth, eleventh, ninth and sixth,
Have thirty days to each affix'd ;
And ev'ry other, thirty-one,
Except the second month alone,
Which has but twenty-eight in fine,
Till leap year gives it twenty-nine.

EXAMPLES.

1. In 30240 minutes how many weeks?
Answer 3 weeks.
2. Reduce 271641 seconds to days.
Facit 3D. 15H. 27M. 21sec.

3. Reduce 37 weeks 5 days into minutes.
Facit 380160M.
4. How many seconds are there in a year?
Answer 31557600 sec.
5. In one year how many hours?
Answer 8766H.
6. Reduce 504 hours to weeks. *Facit 3W.*

ADDITION

OF WEIGHTS AND MEASURES.

Addition of weights and measures teaches to collect several quantities, &c. in their respective names, into one sum.

RULE.

Place the numbers so that those of the same denomination may stand directly under one another; then begin at the right hand column and add up as in integers; reduce the total into the next greater name by rule 1. of reduction; set down the remainder and carry the quotient to the next column, and so proceed.

PROOF.

Perform the addition downward.

TROY WEIGHT.

lb.	oz.	dwt.	gr.	lb.	oz.	dwt.	gr.
1	11	16	23	1	10	17	23
1	9	19	16	2	11	16	19
0	3	13	19	3	9	19	16
1	10	18	17	1	10	4	7
<hr/>				<hr/>			
6	0	9	3				
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1. What is the sum of 36lb. 7oz. 16dwt. 48lb. 7oz. 16gr. 2lb. 11oz. and 13lb. 9oz. 17dwt.? *Answer* 101lb. 11oz. 13dwt. 16gr.

2. A goldsmith bought seven ingots of silver, three of which weighed each 9lb. 7oz. 14dwt. and each of the rest 8lb. 5oz. 15dwt. 16gr. how much did the whole weigh?

Answer 62lb. 10oz. 4dwt. 16gr.

AVOIRDUPOIS WEIGHT.

Cwt.	qr.	lb.	Cwt.	qr.	lb.	T. Cwt.	qr.	lb.
19	2	17	12	3	25	17	11	2 18
80	1	11	87	0	30	82	8	1 10
13	3	26	61	2	19	62	9	3 20
16	2	19	17	1	17	10	11	1 24
<hr/>			<hr/>			<hr/>		
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1. Suppose a grocer bought 4 hoghead sugar, weighing as follow, No. 1. 8*C. wt.* 26*lb.* No. 2. 9*C. wt.* 3*qrs.* 11*lb.* and No. 3 each 12*C. wt.* 2*qrs.* 19*lb.* what is the weight? *Answer* 43*C. wt.* 2*qrs.* 1

2. Add 1*C. wt.* 1*qr.* 11*lb.* 16*C. wt.* 2*qrs.* 1 24*C. wt.* 0*qr.* 7*lb.* and three hundred weight three quarters and eighteen pounds together and tell the amount. *Facit* 45*C. wt.* 3*qrs.* 2

APOTHECARIES WEIGHT.

<i>lb.</i>	<i>℥.</i>	<i>ʒ.</i>	<i>℥.</i>	<i>gr.</i>	<i>lb.</i>	<i>℥.</i>	<i>ʒ.</i>	<i>℥.</i>
6	7	4	1	11	1	2	5	0
3	4	3	1	9	8	11	7	2
8	9	2	2	14	6	10	4	1
2	11	5	1	15	3	1	3	1
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1. Add 3*℥.* 4*ʒ.* 1*℥.* 4*ʒ.* 4*ʒ.* 2*℥.* 18*grs.* and 6*℥.* 5*ʒ.* 2*℥.* 18*grs.* together

Facit 15*℥.* 33*ʒ.* 9*℥.* 16

2. Suppose a druggist mix simples together as follows, 1*℥.* 2*ʒ.* 7*ʒ.* 2*nd.* 1*℥.* 4*ʒ.* 19*grs.* 3*rd.* 3*℥.* 19*grs.* and 6*℥.* 2*ʒ.* 12 what is the weight of the compound?

Answer 13*℥.* 63*ʒ.* 1*℥.* 10

LONG MEASURE.

<i>Deg.</i>	<i>M.</i>	<i>fur.</i>	<i>P.</i>	<i>Deg.</i>	<i>M.</i>	<i>fur.</i>	<i>P.</i>	<i>yds.</i>	<i>ft.</i>	<i>in.</i>	<i>tc.</i>
6	37	2	22	4	41	3	21	126	2	6	1
3	22	5	18	5	18	4	19	878	1	5	2
8	58	7	16	7	15	6	17	361	2	10	2
3	19	7	32	3	17	7	29	196	1	11	2

1. Add 1 *M.* 7 *fur.* 34 *P.* 11 *M.* 3 *fur.* 19 *P.*
4 *M.* 6 *fur.* 37 *P.* and 4 *M.* 16 *P.* together.

Facit 22 *M.* 2 *fur.* 26 *P.*

2. Admit a man travelled one day 27 *M.*
2 *fur.* another 32 *M.* 7 *fur.* 33 *P.* a third 19 *M.*
7 *fur.* 16 *P.* and lastly only 12 *M.* 5 *fur.* how
far did he travel in all? *answer* 92 *M.* 6 *fur.* 9 *P.*

CLOTH MEASURE.

<i>yds.</i>	<i>qr.</i>	<i>na.</i>	<i>yds.</i>	<i>qr.</i>	<i>na.</i>	<i>E.E.</i>	<i>qr.</i>	<i>na.</i>
27	2	3	68	7	2	67	4	3
72	1	1	31	2	2	32	0	1
16	3	2	67	3	3	48	3	2
94	1	1	19	1	2	19	1	3

1. Add 11 E. Fl. 2qr. 2na. 19 E. Fl. 1qr. 7 E. Fl. 2qrs. 3na. 4 E. Fl. 1qr. 3na. and 1 E. 2qrs. 2na. together. *Facit* 45 E. Fl. 1qr. 3na.

2. There are 4 pieces of linen, viz. No. 1. 27yds. 2qrs. 3na.; No. 2. 41yds. 3qrs. 3na.; No. 3. 36yds. 1qr. 2na.; No. 4. 33yds. 2qrs. 1na. how many yards are therein?

answer 139 yds. 2qrs. 1na.

LAND MEASURE.

A.	R.	P.	A.	R.	P.	A.	R.
62	3	31	786	2	30	246	1
36	0	9	213	1	10	542	3
49	3	17	476	3	28	379	0
16	1	37	367	2	39	712	2

1. Add 27 A. 3 R. 27 P. 17 A. 3 R. 36 P. and 41 A. 3 R. 19 P. together. *Facit* 87 A. 3 R. 2 P.

2. Admit a man has one field of wheat containing 11 A. 23 P. another of rye 9 A. 2 R. 1 P. pieces of pasture each 17 A. 1 R. 11 P. meadow 21 A. 14 P. woodland 59 A. 3 R. 20 P. what quantity of land does he hold?

answer 136 acres 39 perch

LIQUID MEASURE.

F. hhd.	gal.	T. hhd.	gal.	Gal.	qts.
3	2	40	493	2	1
6	1	23	531	1	1
7	3	52	786	3	1
9	2	19	789	1	1

1. Add 37gal. 3qt. 19gal. 1qt. 1pt. 63gal. and 10gal. 1qt. together.

Facit 130gal. 1qt. 1pt.

2. Sold 4 vessels of cider, 2 of which contained 94 gallons each, and the other two 87 gallons 2 quarts each, how many gallons in all?

Answer 363gal.

DRY MEASURE.

bu.	pe.	qt.
71	3	4
28	0	4
67	3	6
79	3	7

bu.	pe.	qt.
769	1	6
230	2	2
317	1	5
291	2	4

bu.	pe.	qt.
63	2	5
36	1	3
79	1	2
91	3	7

1. Add 14bu. 2pe. 5qts. 19bu. 7qts. 104bu. 3pe. 3qts. 191bu. 1pe. 1qt. and 17bu. 2pe. 2qts. together.

Facit 347bu. 2pe. 2qts.

2. Bought 136bu. of corn of one man, 197bu. 2pe. of another, 200bu. 1pe. 6qts. of a third, and had on hand 764bu. what is the whole quantity? *Answer* 1297bu. 3pe. 6qts.

3. What is the sum of 36bu. 2pe. 1qt. 375bu. 5qts. and 97bu. 3pe. 4qts.?

Answer 509bu. 2pe. 2qts.

TIME.

<i>Y. Mo. we. da.</i>	<i>Y. Mo. we. da.</i>	<i>da. h. min. sec.</i>
13 2 2 3	86 7 3 5	317 21 41 56
86 10 1 4	13 5 0 2	682 2 18 4
19 11 3 5	19 12 2 0	761 12 14 37
9 9 2 6	16 11 2 4	319 19 57 25
<hr/>	<hr/>	<hr/>
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1. Add 1Y. 11Mo. 3we. 10Y. 12Mo. 1we. 5da. 7Y. 6Mo. 3we. 2da. and 5Y. 9Mo. 2we. 4da. together.

Facit 26Y. 1Mo. 2we. 4da.

2. Admit A. to be 11Y. 3Mo. 2we. old, B. 9Y. 7Mo. 3we. 5da. C. 10Y. 2Mo. and D. 14Y. 12Mo. 1we. 6da. what is the sum of their ages?

Answer 45Y. 12M. 3we. 4da.

SUBTRACTION OF WEIGHTS AND MEASURES.

Subtraction of weights and measures, teaches to take a quantity of divers denominations from another, and shews their difference.

RULE.

Place the numbers as in addition, and with *the less under the greater* ; then begin at the

right hand, and take the under from the upper ; but when the lower number is greater than the upper, take it from as many of that denomination as make one of the next greater, and to the remainder add the upper number ; set down the result and carry one to the next name, &c.

PROOF.

The sum of the remainder and the less quantity will equal the greater.

TROY WEIGHT.

	lb.	oz.	dwt.	gr.		lb.	oz.	dwt.	gr.
	2	10	18	21		1	4	16	21
	1	11	19	17		1	2	19	22
	<hr/>					<hr/>			
Rem.	0	10	19	4					
	<hr/>					<hr/>			
Proof	2	10	18	21					
	<hr/>					<hr/>			

1. From 127lb. 9oz. 8grs. taking 98lb. 10oz. 9dwt. 20grs. what remains?

Answer 28lb. 10oz. 10dwt. 12grs.

2. Bought 3 ingots of silver, weighing 204lb. 6oz. 10dwt. and sold two of them, weighing 108lb. 6oz. 11dwt. 13grs. the weight of the other is required.

Facit 95lb. 11oz. 18dwt. 11grs.

AVOIRDUPOIS WEIGHT.

<i>T.</i>	<i>C.</i>	<i>qr.</i>	<i>lb.</i>	<i>C.</i>	<i>qr.</i>	<i>lb.</i>	<i>oz.</i>	<i>d.</i>
52	12	3	15	49	1	12	14	15
24	14	2	26	17	3	22	15	9

1. Bought 45*C.* 1*qr.* 7*lb.* of sugar, and sold 39*C.* 20*lb.* what remains? *Ans.* 6*C.* 15*lb.*
2. From 17*T.* 7*C.* 2*qrs.* take 12*C.* 3*qrs.* 9*lb.* *Facit* 16*T.* 14*C.* 2*qrs.* 19*lb.*

APOTHECARIES WEIGHT.

<i>lb.</i>	<i>℥.</i>	<i>ʒ.</i>	<i>℥.</i>	<i>gr.</i>	<i>lb.</i>	<i>℥.</i>	<i>ʒ.</i>	<i>℥.</i>	<i>gr.</i>
9	1	2	2	12	16	10	4	1	10
3	9	1	2	17	9	7	6	1	11

1. From 3*lb.* 3*℥.* 13*ʒ.* 1*℥.* 12*grs.* taking 1*lb.* 7*℥.* 0*ʒ.* 2*℥.* 18*grs.* what is left? *Answer* 1*lb.* 8*℥.* 0*ʒ.* 1*℥.* 14*grs.*
2. If out of 6*lb.* 10*℥.* 63*ʒ.* 2*℥.* of medicine, be taken 4*lb.* 5*℥.* 43*ʒ.* 1*℥.* 17*grs.* what quantity will remain? *Answer* 2*lb.* 5*℥.* 23*ʒ.* 0*℥.* 3*grs.*

LONG MEASURE.

<i>M. fur.</i>	<i>P.</i>	<i>yds.</i>	<i>ft.</i>	<i>in.</i>	<i>bc.</i>	<i>Deg.</i>	<i>M. fur.</i>	<i>P.</i>			
24	6	27	367	2	1	2	21	41	6	21	
19	7	35	198	1	9	1	19	36	8	36	
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1. From 50L. 2M. 1fur. take 19L. 18P.
4 yds. *Facit* 31L. 2M. 21P. 1½ yds.

2. Subtract 18M. 3fur. 27P. from 100M.
1fur. and 35P. *Facit* 81M. 6fur. 8P.

CLOTH-MEASURE.

<i>yds.</i>	<i>qr.</i>	<i>na.</i>	<i>yds.</i>	<i>qr.</i>	<i>na.</i>	<i>E.Fl.</i>	<i>qr.</i>	<i>na.</i>
47	2	2	71	1	3	37	2	2
39	2	3	17	2	1	29	2	3

1. From 85E.E. 4qr. 2na. take 18E.E. 4qr.
3na. *Facit* 66E.E. 4qrs. 3na.

2. Bought a piece of cloth containing 14 yds.
2qrs. and sold thereof 31 yds. 1qr. 2na. how
much remains? *Answer* 10 yds. 2na.

LAND MEASURE.

<i>A.</i>	<i>R.</i>	<i>P.</i>	<i>A.</i>	<i>R.</i>	<i>P.</i>	<i>A.</i>	<i>R.</i>	<i>P.</i>
87	2	17	90	3	27	500	0	0
19	3	29	27	2	24	174	2	21

1. From 100A. 2R. having sold 31A. 1R. 20P. how much remains?

Answer 69A. 20P.

2. Take 97A. 23P. from a tract of land containing 312A. and what quantity will remain?

Answer 214A. 3R. 17P.

LIQUID MEASURE.

T. hhd. gal.	T. hhd. gal.	hhd. gal. qts. pt.
27 1 41	29 3 40	17 21 1 0
19 3 19	16 2 27	9 26 2 1

1. Out of 120gal. 1qt. take 72gal. 3qts. 1pt.

Facit 47gal. 1qt. 1pt.

2. Subtract 14gal. 1qt. 1pt. from 63gal.

Facit 48gal. 2qts. 1pt.

DRY MEASURE.

bu. pe. qt.	bu. pe. qt.	bu. pe. qt.
28 1 6	341 3 6	471 3 4
9 3 1	298 1 2	196 2 7

1. Take 19bu. 2pe. 7qt. from 39bu. 1pe. 2qts.

Facit 19bu. 2pe. 3qts.

2. Out of a granary containing 500bu. having sold 374bu. 2pe. 7qts. of wheat, what quantity remains?

Answer 125bu. 1pe. 1qt.

TIME.

<i>da. h. min.</i>	<i>da. h. min.</i>	<i>Y. mo. da.</i>
21 13 47	111 21 16	1802 5 27
17 21 56	97 21 53	769 9 18
<hr/>	<hr/>	<hr/>
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1. From 14Y. 6mo. take 9Y. 8mo. 2we. 1da.

Facit 4Y. 10mo. 1we. 6da.

2. An apprentice who was bound by indenture to serve 6 years, having continued 5Y. 8mo. 3we. 4da. would know the remainder of his time.

Answer 4mo. 3da.

MULTIPLICATION OF WEIGHTS AND MEASURES.

Multiplication of weights and measures teaches to find a quantity equal to a given one, taken any proposed number of times.

RULE.

Multiply the lowest denomination of the given quantity as integers—reduce the product to the next greater name by rule 1. of reduction: set down the remainder, if any; under-

H

neath, and carry the quotient to the produ
of the next denominations and so proceed.

PROOF.

Multiply as before and set the result of ea
reduction under like names of the given qua
ntity—The amount of these quantities will equ
the product of the sum.

EXAMPLES.

Multiply 10z. 17dwt. 21grs. by 6.

oz. dwt. grs.	oz. dwt. grs.
1 17 21	1 17 21
6	6
<hr/>	
Facit 11 7 6	5 6
<hr/>	5 2
	6

Proof 11 7 6

Cwt. qr. lb. oz. dr.	T. Cwt. qr. lb.
38 1 18 15 12	61 11 3 27
3	4
<hr/>	<hr/>
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<i>lb.</i>	<i>3.</i>	<i>3.</i>	<i>3.</i>	<i>gr.</i>	<i>Deg.</i>	<i>M.</i>	<i>fur.</i>	<i>P.</i>	<i>yd.</i>	<i>ft.</i>	<i>in.</i>	<i>bc.</i>
8	11	7	2	19	3	22	5	18	76	2	9	1
				5				6				7

<i>yd.</i>	<i>gr.</i>	<i>na.</i>	<i>A.</i>	<i>R.</i>	<i>P.</i>	<i>hhd.</i>	<i>gal.</i>	<i>qts.</i>	<i>pt.</i>
27	2	3	36	2	12	2	40	3	1
		8			9				10

<i>T.hhd.</i>	<i>gal.</i>	<i>bu.</i>	<i>pe.</i>	<i>qt.</i>	<i>bu.</i>	<i>pe.</i>	<i>qt.</i>
5	3	48	79	2	6	176	3
		11			12		8

<i>r.</i>	<i>M.</i>	<i>W.</i>	<i>D.</i>	<i>D.</i>	<i>H.</i>	<i>min.</i>	<i>sec.</i>
1	10	2	3	219	21	27	52
			11				12

1. A goldsmith bought 11 ingots of silver, weighing each 4lb. 10z. 15dwt. 22grs. what is the whole amount?

Answer 45lb. 7oz. 15dwt. 2grs.

2. Sold 5 hogsheads of rice, weighing each 12C.wt. 1qr. 27lb. what is the whole weight?

Answer 62C.wt. 1qr. 23lb.

3. An apothecary mixed 6 parcels of drugs, weighing each 28lb. 7 $\frac{1}{2}$ z. 33. 1 $\frac{1}{2}$ d. 13grs. what is the total weight?

Answer 171lb. 8 $\frac{1}{2}$ z. 53. 18grs.

4. Multiply 1787yds. 1ft. 11in. 2 $\frac{1}{2}$ c. by 9.

Facit 16088yds. 2ft. 9in.

5. Purchased 2 pieces of cloth, measuring each 17yds. 3qrs. 2na. what number of yards were therein?

Answer 35yds. 3qrs.

6. In 6 tracts of land, containing each 125A. 1R. 27P. how many acres?

Answer 752A. 2R. 2P.

7. A grocer purchased 10 vessels of vinegar, containing 97gal. 1qt. 1pt. each; what number of gallons in all?

Answer 973gal. 3qts.

8. Admit a man has 3 granaries, which contain 87bu. 2pe. each, how many bushels will they hold?

Answer 262bu. 2pe.

9. What is the product of 375bu. 3pe. 7qts. multiplied by 9?

Answer 3383 bu. 2pe. 7qts.

10. Multiply 726bu. 3pe. 5qts. by 12.

Facit 8732bu. 3pe. 4qts.

DIVISION OF WEIGHTS AND MEASURES.

Division of weights and measures teaches to divide quantities in their several denominations.

RULE.

Divide the greatest name of the given quantity as integers ; if any remain reduce and add it to the next lower denomination by rule 2. of reduction ;—divide the result as before, and so proceed.

PROOF.

By multiplication of weights and measures.

EXAMPLES.

Divide 7*lb.* 10*oz.* 11*dwt.* 14*grs.* by 2.

<i>lb.</i>	<i>oz.</i>	<i>dwt.</i>	<i>grs.</i>		<i>lb.</i>	<i>oz.</i>	<i>dwt.</i>	<i>grs.</i>
2)7	10	11	14		3	11	5	19
<hr/>					<hr/>			
<i>Facit</i>	3	11	5	19				
	<hr/> <hr/>				<hr/> <hr/>			
			1		Proof	7	10	11 14
						<hr/> <hr/>		

<i>lb.</i>	<i>oz.</i>	<i>dwt.</i>	<i>gr.</i>		<i>T. C.</i>	<i>wt.</i>	<i>qr.</i>	<i>lb.</i>
3)13	7	2	12		4)53	18	2	24
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<i>lb.</i>	<i>3.</i>	<i>3.</i>	<i>4.</i>	<i>gr.</i>	<i>deg.</i>	<i>M. fur.</i>
5)12	10	7	0	9	6)12	50 3 8

<i>yd.</i>	<i>ft.</i>	<i>in.</i>	<i>bc.</i>	<i>yd.</i>	<i>qr.</i>	<i>na.</i>	<i>E.F.</i>	<i>qr.</i>	<i>na.</i>
7)634	0	2	1	8)61	2	0	9)89	0	3

<i>E.E.</i>	<i>qr.</i>	<i>na.</i>	<i>A.</i>	<i>R.</i>	<i>P.</i>	<i>A.</i>	<i>R.</i>	<i>P.</i>
10)38	2	2	11)211	1	28	12)24	2	18

<i>T.</i>	<i>hhd.</i>	<i>gal.</i>	<i>gal.</i>	<i>qt.</i>	<i>pt.</i>	<i>gal.</i>	<i>qt.</i>	<i>pt.</i>
5)17	3	22	6)671	1	0	7)100	2	1

<i>bu.</i>	<i>pe.</i>	<i>qt.</i>	<i>da.</i>	<i>h.</i>	<i>min.</i>	<i>T.</i>	<i>mo.</i>	<i>w.</i>	<i>da.</i>
8)88	0	1	9)29	19	36	10)6	4	1	5

1. Sold 6 tankards, weighing together 6lb. 11oz. 13dwt. what was the weight of each?

Answer 1lb. 10z. 18dwt. 20grs.

2. Purchased 10 bags of coffee, weighing together 14C.wt. 3qrs. 18lb. now admitting them to be of equal weight, find the quantity contained in each bag.

Facit 1C.wt. 1qr. 27lb.

3. A druggist, having mixed several simples, weighing in all 5lb. 8 $\frac{3}{4}$ z. 23. would divide the compound into 3 equal parts, what will be the weight of each?

Answer 1lb. 10 $\frac{3}{4}$ z. 63.

4. Divide 22M. 4fur. 24P. by 7.

Facit 3M. 1fur. 32P.

5. Divide 150yds. 2qrs. 1na. by 11.

Facit 13yds. 2qrs. 3na.

6. A tract of land containing 614A. 0R. 24P. is to be divided equally among 4 brothers; query the share of each?

Answer 153A. 2R. 6P.

7. Eight men purchased several pipes of wine, containing in all 963 gallons, which is to be divided equally among them; what number of gallons will be to each man's share?

Answer 120gal. 1qt. 1pt.

8. What is the quotient of 115C.wt. 2qrs. 12lb. divided by nine?

Answer 12C.wt. 3qrs. 12lb.

PROMISCUOUS EXAMPLES IN REDUCTION.

1. In 742 dollars how many mills?
Answer 742000m.
2. Reduce 75460 mills to dollars.
Facit 75D. 46c.
3. Reduce 322999 pence to pounds.
Facit £.1345 16s. 7d.
4. In £.916 10s. 9½d. how many quarters?
Answer 879879qrs.
5. In £.77 14s. 7½d. how many half-pence?
Answer 37311 half-pence.
6. In 879879qrs. how many pounds?
Answer £.916 10s. 9½d.
7. In 37311 half-pence, how many pounds?
Answer £.77 14s. 7½d.
8. Reduce £.160 15s. 6d. into six-pences.
Facit 6431 six-pences.
9. Reduce £.194 10s. 8d. to groats.*
Facit 1672groats.
10. In 6431 six-pences how many pounds?
Answer £.160 15s. 6d.
11. In 35016 groats, how many pounds?
Answer £.583 12s. 0d.
12. Reduce 1678 dollars to six-pences?
Facit 25170 six-pences.
13. In 728 dollars, how many pence and farthings?
Answer 65520d. 262080qrs.

* A groat is 4 pence.

14. In 107100 pence, how many guineas,
at 35s. each? *Answer 255 guineas.*

15. In 85 English guineas, how many pence
in Pennsylvania currency? *Answer 35700d.*

16. Reduce £.137 15s. 6½d. into farthings,
and these again to pounds. *Facit 132267qrs.*

17. Bring £.275 11s. 1½d. to half-pence,
and these back to pounds.

Facit 132267 half-pence.

18. Reduce 213120 grains to pounds.

Facit 37lb.

19. Bring 59lb. 13dwt. 5grs. to grains.

Facit 340157grs.

20. In 15 tons, how many hundred weight,
quarters; and pounds?

Answer 300Cwt. 1200qrs. 33600lb.

21. Reduce 67200 pounds to tons.

Facit 30 tons.

22. In 17 pounds, how many ounces, drams
and scruples? *Answer 204℥. 1632℥. 4896℥.*

23. In 1332005 grains, how many pounds?

Answer 231lb. 3℥. 5grs.

24. Reduce 3M. 7fur. 8P. 3yds. 2in. into
inches.

Facit 247214in.

25. In 17yds. 2qrs. 2na. how many nails?

Answer 284na.

26. How many yards are there in 1460 nails?

Answer 91yds. 1qr.

27. A tract of land, containing 1299600
square perches, is to be divided into 25 plan-
tations; query the number of acres in each?

Answer 324A. 3R. 24P.

730716 A

100 Reduction of Weights & Measures.

28. Reduce 45 acres 2 roods 27 perches
into perches. *Facit 7307 P.*

29. How many quarts are there in 17 hhd.s.?

Answer 1071 qts.

30. Reduce 3764 quarts to bushels.

Facit 117 bu. 2 pe. 4 qts.

31. In 2 years 3 months 1 week 16 days,
how many minutes? *Answer 1188000 min.*

32. How many pounds in 1764964 pence?

Answer £.7354 os. 4d.

33. Reduce £.36 12s. 4d. into pence.

Facit 8788d.

34. In 476473 cents, how many dollars?

Answer 4764 D. 73c.

35. Reduce 35 dollars to mills.

Facit 35000d.

36. Bring £.750 to farthings.

Facit 720000 qrs.

37. How many pence, groats and six-pences
are in £.24 4s.?

Answer 5808d. 1452 groats, 968 six-pences.

38. In 262080 farthings, how many dollars
and pounds? *Answer 728 D. £.273.*

39. How many parcels of 6lb. 8lb. 12lb. and
16lb. can a grocer have out of two hogheads
of tobacco, each weighing neat 4 Cwt. 3 qrs.
24 lb. and to have of each a like number?

Answer 26 of each, and 20 lb.

40. Reduce 24796800 seconds to weeks.

Facit 41 weeks.

THE SINGLE RULE OF THREE.

The single rule of three, is that wherein three numbers or terms are given; two of which are of one kind, to find a fourth proportional number of the same name with the other given sum; and this consists of two proportions, viz. direct and inverse.

RULE FOR STATING, &c.

Of the two similar terms, set that in the *first* place which implies the supposition, that of the same kind with the term sought in the *second* place, and that on which the demand lies, in the *third*: If the first and third be not of one denomination, reduce both to the lowest in either by rule 2. of reduction; and the second to its lowest given denomination; then consider whether the example be in direct or inverse proportion.

DIRECT PROPORTION.

Direct proportion is that wherein the third term is greater than the first, and requires the fourth to be greater than the second, or the third less than the first; and requires the fourth to be less than the second.

RULE.

Multiply the *second* and *third* terms together, and divide the product by the *first*; the quotient will be the fourth term, or answer, in the same name with the second.

PROOF.

Invert the question, beginning with the answer, and the result will be the first term.

EXAMPLES.

1. 5 yds. 3 qrs. 2 na. of cloth cost 17 D. 62½ cents; how much was that a yard?

<i>yds. qr. na.</i>	<i>D. cen. m.</i>	<i>yds.</i>
If 5 3 2 ..	17 62 5 ::	1 less req. less
4	16	4
—	—	—
23	94)282 00	0(3 Dol. 4
4	282	Answer 4
—	—	—
94 na.		16 na.
—	—	—

Dot. *yd.* *D. ct.m.*
 If 3 .. 1 :: 17. 625 more req. more

1000

3000

3|000)17|625

5 yds. + 2625

4

3|000)10|500

3 grs. + 1500

4

Proof 5 yds. 3 grs. 2 na.

3|000)6|000

2 na.

2. If 8 yards of cloth cost 24s. what will 96 yards come to?

ys. *s.* *ys.*

If 8 .. 24 :: 96 more req. more

3

288

8

8)2304

2|0)28|8s.

Ans. £. 14 8

£. *s.* *ys.* *s.*

If 14 8 .. 96 :: 24 less req. less

20

6

288

576

4

288)2304(8 yds. Proof.

2304

I

3. If 12 yards of cloth cost £.1 16, wh
will 192 yards come to? *Answer* £.28 1

4. Bought 192 yards of cloth for £.28 1
what is that a yard? *Answer* 3 9 0 0 1

5. If 16lb. of sugar cost £.1 12, what is t
value of C.wt.? *Answer* £.11 4

6. Paid 2D. 75c. for 14lb. of sugar, how
much is that a C.wt.? *Answer* 22D.

7. If an hundred weight of sugar cost 21D.
28 cents, what is that a pound?

Answer 19 cents.

8. If 72 yards of linen cost £.5 8, what will
168 yards come to at that rate?

Answer £.12 12.

9. If a pair of stockings cost 4s. 6d. what
cost 19 dozen pairs at that rate?

Answer £.51 6.

10. Bought 56lb. of butter at 16d. a lb.
what came it to? *Answer* £.3 14 8.

11. What will 9 yards of cambrick cost at the
rate of £.44 16. for 72 yards? *Answer* £.5 12.

12. If 96lb. of sugar cost £.3 12, what is
that a pound? *Answer* 9d.

13. If 36oz. 10dwt. of silver be worth
£.9 2 6, what is that an ounce? *Ans.* 5s.

14. What do 518lb. of tea come to, if 90lb.
cost £.18? *Answer* £.103 12.

15. If 17T. 12C.wt. of iron cost £.165,
what is that for 2C.wt.? *Answer* 18s. 9d.

16. What must be paid for 53E.E. 1qr. of
holland, at the rate of 7s. 9½d. a yard?

Answer £.25 18 1½.

17. If 5 yards of cloth cost 14s. 2d. what must be given for 9 pieces, containing each 21 yds. 1qr. ? *Answer* £.27 1 10½.

18. Calculate the amount of 17 C.wt. 2 qrs. 17 lb. of coffee, at 23 cents a lb.

Facit 454 D. 71c.

19. What will a hogsheaf of sugar come to, weighing 7 C.wt. 3 qrs. at 10 D. 62½ cents a C.wt. ? *Answer* 82 D. 34c. 3m. + 3.

20. If 27 dollars 50 cents be paid for 7 yds. of cloth, what will 3 pieces come to, containing each 27 yards 3 qrs. ?

Answer 327 D. 5c. 3m. + 16.

21. What must be given for 7 yards 3 quarters 2 nails of silk velvet, at 6 dollars a yard ?

Answer 47 D. 25c.

22. How much will 756 bushels of salt come to, at 87½ cents a bushel ?

Answer 661 D. 50c.

23. Paid £.5 12 6 for 3 yards of cloth; what will 9 pieces, containing 225 yards, come to at that rate, and how much a piece ?

Answer £.421 17 6 £.46 16. 6 a piece.

24. Calculate the amount of 1475 bushels of Indian corn, at 87½ cents a bushel.

Facit 1290 D. 62½c.

INVERSE PROPORTION.

Inverse proportion is that wherein the term is greater than the first, and requires the fourth to be less than the second; *Or,* third less than the first, and requires the fourth to be greater than the second.

RULE.

Multiply the *first* and *second* terms together and divide the product by the *third*, the quotient will be the answer.

PROOF.

As in direct proportion.

EXAMPLES.

1. How much in length that is $4\frac{1}{2}$ inch broad will make a square foot?

<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>	<i>in.</i>
If 12	.. 12	:: $4\frac{1}{2}$	32	.. $4\frac{1}{2}$:: 12
2		2	9	2	
—		—	—	—	
24		9	12)288	9	
12		—	—	—	
—					
				2)24 half inches.	
				—	
9)288					
—					
			Proof 12 <i>in.</i> first term		
			=		
Ans. 32 inches.					
=					

2. If 48 men can build a wall in 24 days, how many could do the same in 192 days?

Answer 6 men.

3. What quantity of shalloon that is 3 qrs. of a yard wide, will line $7\frac{1}{2}$ yards of cloth that is $1\frac{1}{4}$ yard wide?

Answer 15 yards.

4. If 100 men can finish a piece of work in 12 days, how many are sufficient to do it in 3 days?

Answer 400 men.

5. How many yards of matting 2 feet 6 in. broad, will cover a floor that is 27 feet long and 20 broad?

Answer 72 yards.

6. How many yards of cloth 3 qrs. wide are equal in measure to 30 yards of 5 qrs. wide?

Answer 50 yards.

7. If £.100 in 12 months gain £.6 interest, what principal will gain the same in 8 months?

Answer £.150.

8. How many men must be employed to finish a piece of work in 15 days, which 5 men can do in 24 days?

Answer 8 men.

9. If a footman perform a journey in 3 days, when the days are 16 hours long, how many days will he require of 12 hours long to perform the same in?

Answer 4 days.

10. If 6 men can reap a field of wheat in 12 days, in what time could 24 men do it?

Answer 3 days.

11. A. lent B. £.500 for six months, how long ought B. to lend A. £.220 to be equivalent?

Answer 13mo. 19 days. + 20.

12. How many yards of matting that is ^{ba} a yard wide, will cover a room that is 18 ^{feet} wide and 30 long? *answer 120 yards.*

DOUBLE RULE OF THREE.

The double rule of three is that, wherein five numbers or terms are given to find a *sixth*; three of which are a supposition, and two a demand; and is either direct or inverse.

RULE FOR STATING.

Set the two terms of the supposition, which are like those of the demand, one under the other, in the first place; that of the same kind with the term sought, in the second, and the two demanding terms in the third place, with the two correspondent terms of the supposition and demand in the same line, and of one denomination.

Then consider the two upper and lower terms, each separately with the middle one, as a stating in the Single Rule of Three—and if *both* lines be direct, the sum is in

DIRECT PROPORTION.

RULE.

Divide the continual product of the two last *extremes* and middle terms by the product of

the two first, and the quotient will be the sixth term or answer, in the same name with the middle term.

PROOF.

By two statings in the Single Rule of Three.

EXAMPLES.

1. If 3 men in 4 days eat 5 lb. of bread; how much will suffice 6 men for 12 days?

If 3 m. } 5 lb. } 6 m. more req. more.
4 d. } 12 d. more req. more.

m.	lb.	m.
12	72	If 3 .. 5 :: 6
5	5	6

12)360

3)30

Answer 30 lb.

10 lb.

d. lb.

If 4 .. 10 :: 12

12

4)120

Proof 30 lb.

2. Suppose 4 men in 12 days mow 48 a.
how many acres can 8 men mow in 16 da

Answer 128 a.

3. If 12 oxen in 16 days eat 20 acres
grais; how many acres will serve 24 oxen
days? *Answer* 120 a.

4. If 10 bushels of oats be sufficient for
horses 20 days; how many bushels will ser
60 horses 36 days, at that rate?

Answer 60 bushel

5. If 56lb. of bread be sufficient for 7 me
14 days; how many pounds will suffice 21 me
3 days? *Answer* 36

6. If 8 men have 3l. 4s. for four days work
how much ought 48 men to receive for 16 day

Answer 76l. 16

7. If 16l. 18s. be the wages of 16 men f
8 days; what sum will 32 men earn in 1
days? *Answer* 101l. 8

8. Suppose the wages of 6 persons for 2
weeks be 120l. what will be the hire of 14 pe
sons for 46 weeks? *Answer* 613l. 6s. 8

9. If 500 dollars in half a year gain 15l
interest, what will be the interest of 1200l
for 7 years? *Answer* 504 dollar

10. If the carriage of 8C.wt. 128 mile
cost 6 dollars 40 cents, what must be paid f
the carriage of 4C.wt. 32 miles?

Answer 80 cent

If either pair of the extremes when considered with the middle term as a stating of the Single Rule of Three be *inverse*, the sum is in

INVERSE PROPORTION.

RULE.

Transpose the inverse extremes; that is, set that of the first place under the third, and that in the third under the first; then work as in direct proportion.

EXAMPLES.

1. If 7 men can reap 84 acres of wheat in 12 days; how many can reap 100 acres in 5 days?

$$\begin{array}{l} \text{If } 84 \text{ A. } \} \\ 12 \text{ d. } \} 7 \text{ m. } \left\{ \begin{array}{l} 100 \text{ A. more req. more.} \\ 5 \text{ d. less req. more.} \end{array} \right. \end{array}$$

$$\begin{array}{r} 5 \\ \hline 420 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ \hline 1200 \\ \hline 7 \\ \hline \end{array}$$

42|0)840|0(20m. Answer.

$$\begin{array}{r} 84 \\ \hline 00 \\ \hline \end{array}$$

The Double Rule of Three.

A. m. A.
 If 84 .. 7 :: 100 more req. more
 100

84)700(8 $\frac{1}{3}$ M.
 672

28

3

84(1
 84

==

d. M. d.
 If 12 .. 8 $\frac{1}{3}$:: 5 less req. more
 3

25

12

15)300

3)60

Proof 20 men.

2. If 4 dollars be the hire of 8 men
 days; how many days must 20 men w
 40 dollars? *Answer 1*

3. If 4 men have 3 dollars 20 cents for 3 days work ; how many men will earn 12 dollars and 80 cents in 16 days ? *Ans.* 3 men.

4. Suppose the interest of 333*l.* 6*s.* 8*d.* for 9 months be 15*l.* what principal in 12 months will gain 6*l.* ? *Answer* 100*l.*

5. If 200*lb.* be carried 40 miles for 3 shillings, how many miles may 20200*lb.* be carried for 22*l.* 14*s.* 6*d.* ? *Ans.* 60 miles.

6. If 145 men can make a wall 32 feet high, and 40 feet long in 8 days ; in how many days can 68 men build a wall 28 feet high of the same length ? *Ans.* 14*d.* 11*h.* +

7. What is the interest of 1000 dollars for 1 week at 6 per cent. per annum ?

answer 1*D.* 15*c.* + 20.

8. If a footman travels 240 miles in 12 days, when the days are 12 hours long ; in how many days of 16 hours long may he travel 720 miles ? *Ans.* 27 days.

9. Calculate the interest on £.500 for 16 weeks, at 6 per cent. per annum.

Facit £.9 4 7½ +

10. If 10 bushels of oats be enough for 18 horses 20 days ; how many bushels will serve 60 horses 36 days ? *Ans.* 60*bu.*

PRACTICE.

Practice is a short method of finding the value of any quantity of goods by the given Price of an integer.

Practice may be proved by compound multiplication: or, by the single rule of three direct.

TABLES.

gr.			s.	d.	
1	=	$\frac{1}{4}$	1	0	= $\frac{1}{20}$
2		$\frac{1}{2}$	1	8	$\frac{1}{12}$
d.			2	0	$\frac{1}{10}$
1	=	$\frac{1}{12}$	2	6	$\frac{1}{8}$
$1\frac{1}{2}$		$\frac{1}{8}$	3	4	$\frac{1}{6}$
2		$\frac{2}{12}$	4	0	$\frac{1}{5}$
3		$\frac{1}{4}$	5	0	$\frac{1}{4}$
4		$\frac{1}{3}$	6	8	$\frac{1}{3}$
6		$\frac{1}{2}$	10	0	$\frac{1}{2}$
		of d.			of a pound.
		of a shilling.			

When the price of an integer is less than a penny, work by

RULE 1.

Take such part or parts of the given quantity as the price is of a penny, for the answer in pence, which reduce to pounds.

EXAMPLES.

1. 375 lb. at $\frac{1}{4}$.

$$\begin{array}{r|l}
 \text{1qr.} & \frac{1}{4} \\
 \hline
 & 12 \\
 \hline
 \text{Facit} & 7s. 9\frac{3}{4}.
 \end{array}$$

375 lb. at $\frac{1}{4}$.

$$\begin{array}{r}
 375 \\
 \hline
 1 \\
 \hline
 4)375 \\
 \hline
 12)93d. + \frac{3}{4}.
 \end{array}$$

Proof 7s. 9 $\frac{3}{4}$ d.

	lb.		£.	s.	d.
2.	467 at $\frac{1}{2}$.	Facit	0	19	5 $\frac{1}{2}$.
3.	720 at $\frac{3}{4}$.	Facit	2	5	0.
4.	976 at $\frac{1}{4}$.	Facit	1	0	4.
5.	1739 at $\frac{1}{8}$.	Facit	3	12	5 $\frac{1}{2}$.
6.	6379 at $\frac{3}{4}$.	Facit	19	18	8 $\frac{1}{4}$.

When the given price of an integer is a penny, or more, but less than a shilling, work by

RULE 2.

Take such part or parts of the quantity, as the price is of a shilling, for the amount in shillings.

EXAMPLES.

1. 764 lb. at 1 $\frac{1}{2}$ d. per lb.

K

lb.	d.	lb.
$1\frac{1}{2}$	$\frac{1}{8}$	764
	2 0	9 5 6
<i>Facit</i> £.4 15 6		
		<i>If</i> $1\frac{1}{2} :: 764$
		$\frac{2}{3}$ 3
		2)2292
		12)1146
		2 0)9 5 +
		<i>Proof</i> £.4 15

lb.	d.	£.	s.
2. 975 at 1		<i>Facit</i> 4	1
3. 1769 at 2		<i>Facit</i> 14	14
4. 7649 at 3		<i>Facit</i> 95	12
5. 1677 at $4\frac{1}{2}$		<i>Facit</i> 31	8
6. 2764 at 6		<i>Facit</i> 69	2
7. 3747 at $7\frac{1}{2}$		<i>Facit</i> 117	1
8. 4697 at 8		<i>Facit</i> 156	11
9. 5764 at 9		<i>Facit</i> 216	3
10. 7649 at 10		<i>Facit</i> 318	14
11. 7796 at $10\frac{1}{2}$		<i>Facit</i> 341	1
12. 8888 at 11		<i>Facit</i> 407	7

When the given price of an integer is 1 than one shilling and less than two, work

RULE 3.

Let the given quantity stand for so many shillings; to which add the amount in shil.

of said quantity at the overplus price, found by rule 1. or 2. for the answer in shillings.

EXAMPLES.

1. 725 yards at 1s. $1\frac{1}{2}d.$ a yard.		
$1\frac{1}{2}$	$\frac{1}{8}$	725 If 1 .. 1 $1\frac{1}{2} :: 725$
		90 $7\frac{1}{2}$ 12 3
	2 0	81 5 $7\frac{1}{2}$ 13 2175
		2 9
Facit £.40 15 $7\frac{1}{2}$		
		27 2)19575
		12)9787d. $+\frac{1}{2}$.
		2 0)81 5 $+7\frac{1}{2}d.$
		Proof £.40 15 $7\frac{1}{2}$.

Yds.	s.	d.	£.	s.	d.
2. 360	at 1	2	Facit 21	0	0
3. 1479	at 1	3	Facit 92	8	9
4. 2764	at 1	$4\frac{1}{2}$	Facit 190	0	6
5. 3712	at 1	5	Facit 262	18	8
6. 2164	at 1	6	Facit 162	6	0
7. 3719	at 1	$7\frac{1}{2}$	Facit 302	3	$4\frac{1}{2}$
8. 4167	at 1	8	Facit 347	5	0
9. 1376	at 1	9	Facit 120	8	0
10. 3764	at 1	10	Facit 345	0	8
11. 7200	at 1	$10\frac{1}{2}$	Facit 675	0	0
12. 3760	at 1	11	Facit 360	6	8

When the given price is any number shillings under 20, work by

RULE 4.

Take such part or parts of the given quantity as the price is of a pound : or

Multiply the quantity by the price for amount in shillings.

EXAMPLES.

1. 766 yards, at 15s. a yard.

10	$\frac{1}{2}$	766	yds
			766
5	$\frac{1}{2}$	383	15
			—
			2 0)1149 0

Facit £.574 10

Proof £.574 1

<i>yds.</i>	<i>s.</i>
2. 3769 at	5
3. 1632 at	7
4. 7329 at	9
5. 2798 at	13
6. 3679 at	17

<i>£.</i>	<i>s</i>
<i>Facit</i> 942	
<i>Facit</i> 571	
<i>Facit</i> 3298	
<i>Facit</i> 1818	1
<i>Facit</i> 3127	

Note. If the price be even shillings, multiply the given quantity by half their number, doubling the right hand figure of product for shillings; the others will be pounds.

EXAMPLES.

1. 473 bushels, at 4 shillings.

$$\begin{array}{r} 473 \\ 2 \end{array}$$

$$| 4 | \frac{1}{2} | 473$$
Proof $\underline{\underline{\pounds.94 \ 12}}$ *Facit* $\underline{\underline{\pounds.94 \ 12}}$

- | | bu. | s. |
|----|--------|----|
| 2. | 713 at | 6 |
| 3. | 916 at | 8 |
| 4. | 739 at | 12 |
| 5. | 297 at | 16 |
| 6. | 900 at | 18 |

- | | $\pounds.$ | s. | d. |
|--------------|------------|----|----|
| <i>Facit</i> | 213 | 18 | 0 |
| <i>Facit</i> | 366 | 8 | 0 |
| <i>Facit</i> | 443 | 8 | 0 |
| <i>Facit</i> | 237 | 12 | 0 |
| <i>Facit</i> | 810 | 0 | 0 |

When the price of an integer is shillings and pence, or shillings, pence and farthings, work by

RULE 5.

Take such aliquot part or parts of the given quantity, as the price is of a pound; or

Multiply by the shillings, and take parts for the rest.

EXAMPLES.

1. 764 yards, at 2s. 6d.

$$| 2s.6d. | \frac{1}{2} | 764$$
Facit $\underline{\underline{\pounds.95 \ 10}}$

$$\begin{array}{r} \text{yd.} \quad \text{s.} \quad \text{d.} \quad \text{yd.} \\ \text{If } 1 \dots 2 \ 6 :: 764 \end{array}$$

$$\begin{array}{r} 2 \qquad 5 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \ 2)3820 \\ \hline \end{array}$$

$$\begin{array}{r} 2|0)191|0 \\ \hline \end{array}$$
Proof $\underline{\underline{\pounds.95 \ 10}}$

	yds.		s.	d.		£.
2.	64	at	3	4	<i>Facit</i>	10
3.	716	at	6	8	<i>Facit</i>	238
4.	979	at	13	4	<i>Facit</i>	652
5.	397	at	16	8	<i>Facit</i>	330
6.	428	at	5	9	<i>Facit</i>	123
7.	673	at	5	$10\frac{1}{2}$	<i>Facit</i>	197
8.	790	at	13	$7\frac{1}{2}$	<i>Facit</i>	538
9.	867	at	15	$7\frac{1}{2}$	<i>Facit</i>	677
10.	916	at	16	$6\frac{1}{2}$	<i>Facit</i>	756
11.	1167	at	17	$4\frac{1}{2}$	<i>Facit</i>	513
12.	1924	at	19	6	<i>Facit</i>	1871
13.	769	at	11	3	<i>Facit</i>	432
14.	975	at	12	6	<i>Facit</i>	606
15.	1724	at	14	2	<i>Facit</i>	1224

When the price of an integer is per pounds, shillings, &c. work by

RULE 6.

Multiply by the pounds, and add the of the given quantity found as before

Multiply by the price in shilling parts for the pence, &c.

EXAMPLES.

1. 428 acres, at £.3 4 $6\frac{1}{2}$.

s.	acres.
4	428
5	3
d.	1284
6	85 12
$\frac{1}{2}$	10 14
$\frac{1}{12}$	17 10
<u>Facit £.1381 3 10</u>	

£.	s.	d.
3	4	$6\frac{1}{2} \times 8$
		10
32	5	5×2
		10
322	14	2
		4
1290	16	8
64	10	10
25	16	4

Proof £.1381 3 10

acres.	£.	s.	d.	Facit	£.	s.	d.
2. 17 at	11	14	0	Facit	198	18	0
3. 23 at	3	3	4	Facit	72	16	8
4. 71 at	6	13	4	Facit	473	6	8
5. 219 at	14	17	$9\frac{1}{2}$	Facit	3260	16	$4\frac{1}{2}$
6. 396 at	12	19	$11\frac{1}{2}$	Facit	5147	3	6
7. 37 at	4	12	6	Facit	171	2	6
8. 154 at	5	13	$1\frac{1}{2}$	Facit	871	1	3
9. 125 at	7	16	8	Facit	979	3	4
10. 419 at	6	2	6	Facit	2566	7	6
11. 523 at	10	3	4	Facit	5317	3	4
12. 697 at	3	19	6	Facit	2770	11	6

INTEREST.

Interest is a consideration allowed use of money; relative to which are particulars, viz.

First, The *principal*, or sum at interest.

Second, The *time*.

Third, The *rate per cent*.

Fourth, The *amount*, which is the principal and interest.

When the interest of any sum for a time is required, work by

RULE 1.

Multiply the principal by the rate per cent, and divide the product by 100.

PROOF.

By the single rule of three.

EXAMPLES.

1. What is the interest of 700 dollars 1 year, at 6 per cent. per annum?

$$\begin{array}{r} D. \\ 700 \\ 6 \end{array}$$

$$\begin{array}{r} D. \quad D. \\ \text{If } 100 \text{ .. } 6 \end{array}$$

$$\text{Ans. } \$ 42 \overline{)00}$$

$$1 \overline{)00}$$

Proof

2. Calculate the interest of 1000 dollars for 1 year, at 6 per cent. per annum.

Facit 60 dollars.

3. What is the interest of £.87 14 5 for 1 year, at 6 per cent. per annum?

£. s. d.	£. £. £. s. d.
87 14 5	If 100 .. 6 :: 87 14 5
6	20 20
<hr/>	<hr/>
£.5 26 6 6	2000 1754
20	12 12
<hr/>	<hr/>
s.5 26	24000 21053
12	6
<hr/>	<hr/>
d.3 18	24 000)126 318(£.5 5 3+
<hr/>	120
	<hr/>
	6318
	20
	<hr/>
<i>Ans.</i> £.5 5 3+18	24 000)126 360(5s.
	<hr/>

4. What is the interest of £.500 for 1 year, at 7 per cent. per annum?

Answer £.35.

Note. When the *amount* is required, add the principal to the interest, found as in the preceding examples.

5. Calculate the amount of a bond, for 75 dollars for 1 year, at 6 per cent. per annum.

Facit 801D. 36c

6. What is the amount of £.173 17 8¹/₂ for a year, at 7 per cent. per annum?

Answer £.186 1 1¹/₂

When the interest of a given sum is required for *several years*, work by

RULE 2.

Multiply the interest of the given sum for *one year*, found as before, by the years given.

PROOF.

By the double rule of three.

EXAMPLES.

1. What is the interest of 700 dollars for 5 years, at 6 per cent. per annum?

$\begin{array}{r} \text{D.} \\ 700 \\ \underline{6} \end{array}$	If 100D. } 1r. }	$\begin{array}{r} \text{D.} \\ 6 \\ \hline \end{array}$	$\left\{ \begin{array}{r} 700D. \\ 5r. \end{array} \right.$
$\begin{array}{r} \text{Int. for 1Y. } 42 00 \\ \underline{5} \end{array}$		$\begin{array}{r} 3500 \\ \underline{6} \end{array}$	
$\text{Answer } \$ 210$		$\begin{array}{r} 1 00)210 00 \\ \hline \end{array}$	
		$\text{Proof } 210D.$	

2. Calculate the interest of 1750 dollars for 7 years, at 6 per cent. per annum.

Facit 735 dollars.

3. What sum will £.750 amount to in 3 years, at 6 per cent. per annum?

Answer £.885.

4. What interest is due on a bond of £.375 10 6 for 4 years, at 7 per cent. per annum?

Answer £.105 2 11.

5. On a mortgage for 1256 dollars there is 4 years interest due, at 6 per cent. per annum, which is to be paid with the principal; what sum will discharge the debt?

Answer 1557D. 44c.

6. An uncle left by will to his niece £.1256 15 6, at the time of her marriage there was 7 years interest due on the legacy, at 6 per cent. per annum; what sum must the executor pay?

Answer £.1784 12 4½.

When interest is to be calculated for months, weeks, or days, work by



RULE 3.

As the months, weeks, or days in a year,
Are to the interest of the given sum for a
year;

So are the months, weeks, or days in the
time given,

To the interest required.

PROOF.

As under rule 2.

EXAMPLES.

1. What will £.350 amount to in 3 ye and 10 months, at 6 per cent. per annum?

£.	M. £. Y. M.
350	If 12..21::3 10
6	12
<hr/>	<hr/>
Int. for 1 Y. £.21 00	46
<hr/>	21
	<hr/>
	46
	92
	<hr/>
	12 966
	<hr/>
Interest	8010
Principal	350
	<hr/>
Amount	£.430 10
	<hr/>

2. What is the interest of 575 dollars 4 years 7 months and 15 days, at 6 per ce per annum? *Answer.* 157*D.* 37*c.* 6*m.*

3. Calculate the interest due on a bond for 3725 dollars for 3 years 5 months and 17 days, at 6 per cent. per annum. *F. 763D. 57c. 3m. +*

4. What is the amount of a bond for £.116 17 2 for 6 years 7 months and 19 days, at 7 per cent. per annum?

Answer £.171 2 7.

Note. When the months are an aliquot part of a year, as $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, take such part of the yearly interest, *practically*, thus,

5. What is the interest of 7500 dollars for 3 months, at 6 per cent. per annum?

Dols.

7500

6

$\begin{array}{r} 3\overline{)112500} \\ \underline{9000} \\ 22500 \\ \underline{18000} \\ 45000 \\ \underline{45000} \\ 000 \end{array}$

Answer Dols. 112 50 cents.

6. What is the amount of 967 dollars for 2 years and 4 months, at 6 per cent. per annum?

Answer 1102D. 38c.

7. Calculate the amount of £.370 10 6 for 1 years 9 months and 15 days, at 7 per cent. per annum.

Facit £.494 16 0 $\frac{1}{2}$.

8. At 6 per cent. per annum, what is the interest on 10000 dollars, for 9 months and 15 days?

Answer 475U.

EXCHANGE.

Exchange is here considered as the ratio which the currency of *any* of the *United* is reduced to that of *another*, or to *F Money*.

RULE.

*As Dollars pass from state to state,
So other sums proportionate.

Or, work by the Theorems in Table

PROOF.

Reverse the question, reducing the result of the operation back to the given currency either of the above rules.

EXAMPLES.

1. Exchange £.371 11 9 Pennsylvania currency for Dollars.

*The answers affixed to the following examples are all produced by the Rule of Proportion and may, perhaps, vary a trifle on account of remainders, when wrought by the other Rule. The pupil however is advised to work each example by both methods.

<i>s. d. cents.</i>	<i>£. s. d.</i>	
As 7 6..100 :: 371 11 9 more req. more.		
12	20	<i>£. s. d.</i>
—	—	371 11 9
90	7431	20
—	12	—
	—	7431
	89181	12
	100	—
	—	9)89181
9 0)891810 0		9909

Facit Dol. 990. 90cts. Facit D. 990. 90cts.

<i>Dol. cts.</i>	<i>d.</i>	<i>cts.</i>
As 990. 90 .. 89181	:	100 less req. less.
100		
—	12	
9909 0)891810 0(90d.		
89181	—	
—	Pr. 7s. 6d. 1st term.	
.....0	—	

2. If £.171 16 7 New York currency be exchanged for Dollars, what number is equivalent? *Answer 429D. 57 cents 2m. +*

3. Reduce 591Dol. 33 cents, into South Carolina currency. *Facit £.137 19 6¼. +*

4. How much New-Hampshire currency is equivalent, to 2759Dol. 79 cents?

Answer £.827 18 8½. +

5. Reduce £.274 19 6 Massachusetts currency to dollars. *Facit* 916*D.* 58*c.* 3*m.* +

6. Change £.248 16 6 South Carolina currency into that of New Jersey.

Facit £.399 17 11½ +

7. What sum Rhode Island currency is equivalent to £.547 13 6 of New York?

Answer £.410 15 1½

8. Reduce £.1903 16 3 New York currency into that of Virginia. *Facit* £.1427 17 2

9. How much Maryland currency is equivalent to £.6307 13 5 of New York?

Answer £.5913 8 9½

10. Reduce £.792 19 7 of North Carolina into Pennsylvania currency.

Facit £.743 8 4

11. Exchange £.807 North Carolina currency for Federal Money. *Facit* 2017*D.* 50

12. What is the value of £.900 Rhode Island, in South Carolina currency.

Answer £.7*c.*

13. Reduce £.6500 17 4 Connecticut currency to Federal Money.

Facit 21669*D.* 55*c.* 5*m.*

14. Reduce £.737 17 7 South Carolina into the currency of Pennsylvania.

Facit £.1185 17 6

15. Exchange £.4790 Georgia currency Dollars. *Facit* 20528*D.* 57*c.* 1*m.*

16. What is the value of a bill of £. Pennsylvania or other like currency, in New York or North Carolina currency? *Ans.* £.8

17. What sum of New York currency is equal to £.173 16 in New Jersey?

Answer £.185 7 8 $\frac{1}{2}$.

18. A Merchant in New York owes £.240 to a Planter in Virginia; how much ought he to be charged with in the Planter's books?

Answer £.180.

19. How much Virginia currency will purchase a bill for £.280 South Carolina currency?

Answer £.360.

20. Reduce £.36791 14 4 of New York to the currency of Pennsylvania.

Facit £.34492 4 8 $\frac{1}{2}$.

PROMISCUOUS QUESTIONS.

1. Write down in figures, one million, thirty seven thousand, five hundred and nine.

2. There are two numbers, the less is 769, and their difference twice as many; what is the greater?

3. Bought of A two barrels of flour, weighing each 196lb. tare a barrel 15lb. of B three ditto, weighing 187lb. each, tare a barrel 20lb. how many pounds of flour neat?

4. Sold eight bales of linen, in 4 of which were 9 pieces each, and in each piece 35 yards; in the other 4 were 12 pieces each, and in each piece 27 yards; how many pieces and yards were there in all?

5. Being desirous to plant 2072 apple-trees in 14 rows, 25 feet asunder; how many trees will be in a row; and how many feet in length and breadth will the orchard be?

6. Sent 1000 dollars to the bank; and having drawn at one time 237 dollars 75 cents, at another 116 dollars 9 cents, and at another 241 dollars 6 cents 5 mills, what further sum may I draw for?

7. Divide £.79 4 10 among 4 men, 6 women, and 9 boys; let each man have twice as much as a woman, and each woman twice that of a boy.

8. A druggist bought two parcels of drugs, which together weighed 9C.wt. 3qrs. 16lb. for £.97 17 6, their difference in weight was 1C.wt. 2qr. 16lb. and in price £.8 13 3, their respective weights and values are required.

9. How many dozen of gallon, quart and pint bottles, of each a like number, will be required to contain a cask of Madeira, whose content is 165 gallons?

10. Two persons depart from the same place at the same time, the one travels 30, the other 35 miles a day; how far are they distant after 7 days, if they travel both the same road; and how far if they travel in contrary directions?

**TABLE, Exhibiting the value of a Dollar
the currency of :**

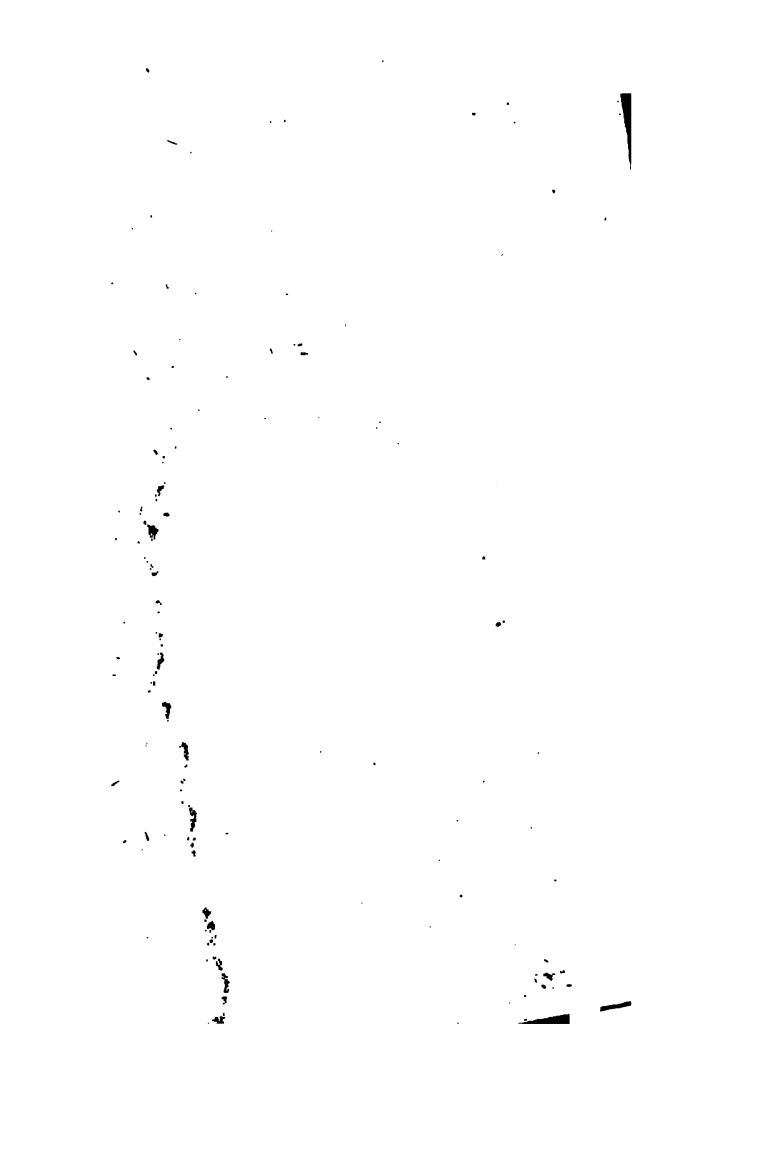
To exchange the currency of		to that of	{ <i>N.E. States Vir ginia Kentuck & Tennessee</i>
*The New England States, Vir. Kentucky & Tennessee.			Dollar 6s.
Pennsylvania, New Jersey, Delaware & Maryland.			Subtract one 5th.
New York and North Carolina			Subtract one 4th.
South Carolina and Georgia.			Add two 7ths.
Federal Money of the United States.			c. $\times 18 \div 25 =$ pence or D. \times $\div 10 = \text{£}.$

*The New England States, are New H

TABLE II, Exhibiting the *Standards*
 current in the U. S. with

<i>NAMES OF COINS.</i>	<i>Standard Weight.</i>	<i>Federal Measure.</i>
*FEDERAL COINS.	<i>dwt. gr.</i>	<i>D. c.</i>
Eagle,	11 6	10, 0
Half Eagle,	5 15	5, 0
Quarter Eagle,	2 19½	2, 1
FOREIGN COINS.		
Johannes,	18 0	16, 0
Half Johannes,	9 0	8, 0
Moidore,	6 18	6, 0
English Guinea,	5 6	4, 0
French Guinea,	5 5	4, 5
French Pistole,	4 4	3, 0
Spanish Doubloon,	17 8	15, 1
Spanish Pistole,	4 8	3, 7

*The standard for Gold Coins
 alloy: and Silver Coins 1485 pa





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1. The first part of the document is a list of names and addresses of the members of the committee.

2.







